FEATURE FOCUS

ISDN: Oceans apart

BY BYRON BELITSOS
Special to Network World

It's little wonder that frustration with the progress of Integrated Services Digital Networks is mounting. While nationwide ISDNs are currently being built and tested by the regulated European telecommunications monopolies, attempts to introduce the Consultative Committee on International Telephony and Telegraphy's standard telecommunications

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▶ LAN STANDARDS

Starlan gets 802.3 blessing

Fiber-optic repeater link also approved.

BY MARGIE SEMILOF
Senior Writer

BRIGHTON, England — The Institute of Electrical and Electronics Engineers overwhelmingly approved two significant standards specifications at its meeting here last week. Included were 802.3 proposals for a low-cost, 1M bit/sec Ethernet — similar to AT&T's Starlan — that works with twisted-pair telephone wire, and for a fiber-optic repeater link used to connect 802.3 Ethernet networks.

"The approval of both specifications is a major milestone and the culmination of two years of committee work," said Don Loughery, chairman of the 802.3 committee and standards manager for Hewlett-Packard Co.'s Information Network Group. The specifications will be sent to an 802.3 parent committee for a letter ballot to be released this month. Loughery said balloting will take place in September, and results will be reported in early October. Specification suggestions must be resolved before November when the 802.3 committee meets in San Diego. Balloting for the fiber-

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NETWORK WORLD

THE WEEKLY FOR LEADING USERS OF COMMUNICATIONS PRODUCTS & SERVICES VOLUME 3, NUMBER 22 AUGUST 4, 1986

▶ LOCAL COMMUNICATIONS

Network nirvana escapes PC users

BY MARY PETROSKY
West Coast Correspondent

First in a two-part series.

The road to the network promised land, where personal computer local nets perform as advertised, is lined with software perils.

Network software problems run the gamut from headaches associated with printing inconveniences and time wasted by limited access to single-user files, to file losses and software that just plain does not work.

"There are some major software products that simply won't work in a local net environment, even though they're supposed to," said David Ferris, chairman and chief executive officer of Ferrin Corp., a San Francisco-based consulting firm. "You try to get them up and running, and you simply can't; they've got bugs in them. An example is dBase III Plus. Ashton-Tate is working hard on that, and we think dBase is going to be one of the core products in the local net environment, but it's having some real teething problems."

Too often, software vendors oversell the

See **Network nirvana** page 5

Rolm severs Octel's Aspen bridge

▶ VOICE MESSAGING

ETS demise hits Rolm, Octel users

Aspen threat to Phonemail cited.

BY PAUL KORZENIOWSKI
Senior Editor

Rolm Corp. users with Octel Corp. Aspen voice message systems face an uncertain future now that Rolm will no longer manufacture the ETS telephone sets and interface cards Octel uses to connect with the Rolm switch line.

Angry users, who wished to remain anonymous, speculated that Rolm's decision was principally based on the fact that Aspen has cut into sales of Rolm's own voice message system, Phonemail. Rolm denied that claim.

For its part, Octel downplayed the marketing move. "We're not pleased with the decision, but it's not a disaster," said David Torrey, Octel's marketing manager.

Rolm stands alone among private branch exchange ven-

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NETWORK LINE

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NEWSPAPER

▶ EUROPEAN MARKETS

W. German modem monopoly busted

Decision to legalize competition will allow private suppliers to sell modems directly to customers for public network use.

BY ALEX SCOTT
CW Communications International News Service
European bureau

BRUSSELS, Belgium — The West German government has agreed to end the monopoly that the national post and telecommunications authority, the Deutsche Bundespost, holds on the supply of modems. The action comes in response to a ruling by the Brussels-based Commission of the European Community (EC) declaring the monopoly illegal.

The ruling, announced by the EC, means private vendors will be able to supply internal and external modems directly to customers.

Until the West German government agreed to change the rules, the Deutsche Bundespost was the only source for a modem that could be connected to the public telephone network. Private suppliers could sell modems, but only for use with private networks.

The EC, which can rule on whether monopolies exist in member nations, had warned the West German government that modem customers were being denied access to modems from private suppliers. It also said that tying the sale or lease of modems to the provision of network services was an abuse of a dominant market position.

> *"Private vendors will be able to supply modems to customers."*

In response, the West German government has agreed to amend the Postal Telephone and Telegraph rules and to publish technical specifications for modems applicable to domestic and imported modems alike. Outside suppliers will now be allowed to offer modems for connection to the public telephone network. The EC said it is investigating potential monopolies in the provision of terminals for use on the public net.

▶ LABOR DISCORD

CWA strike looms on BOCs' horizon as contract deadline approaches

BY NADINE WANDZILAK
Staff Writer

Members of the Communications Workers of America (CWA) union last month voted to authorize a strike at regional Bell operating companies on Aug. 10 if negotiations fail to produce a suitable contract by that time.

Five of the seven RBOCs agreed to the authorizations. The results of the votes at the two remaining RBOCs were unavailable at press time.

The votes give union officials authority to order a strike if a settlement is not reached before the contract expires.

Although strike issues differ by region, the CWA members are basically concerned about job security and wages ("So far, so good in CWA/RBOC dealings," *Network World*, July 28).

According to Ken Major, CWA public relations coordinator for Pacific Telesis Group, CWA members at Southwestern Bell Corp. endorsed a strike by a 3-to-1 margin. CWA members from both Pacific Telesis and US West, Inc. voted 4-to-1 for a strike.

The margin at Nynex Corp. and the New Jersey segment of Bell Atlantic was 10-to-1, according to Clara Allen, district CWA public relations coordinator.

CWA workers in Bell Atlantic's other regions voted 5-to-1 to authorize a strike.

At Southwestern Bell, several sticking points remain, and each side is holding tight to its position, according to William Harwell, CWA public relations coordinator. "But they're still talking, and that's a good sign," he commented.

They're still talking at Pacific Telesis also, said CWA's Major. Employee security is a major focus,

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> *"At Pacific Telesis, employee security is a major focus."*

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▶ FACTORIES ABROAD

MAP heads for Japan

Auto part factory to use MAP-based net.

BY TAKEHISA KONDOH
CW Communications International News Service
Asian bureau

NAGOYA, Japan — One of Japan's leading vendors of automobile electronics gear, Nippondenso Co., said last week that it will use General Motors Corp.'s Manufacturing Automation Protocol as the basis for a factorywide local-area network. The move makes Nippondenso the first Japanese auto industry player to support MAP.

MAP is an implementation of the International Standards Organization's Open Systems Interconnect protocol, which allows computers from different vendors to communicate over a broadband local-area network.

The Nippondenso local net, to be installed at a company factory that is still under construction, will be connected to the equipment that produces fuel injection devices and semiconductor chips. Construction of the $636.9 million factory began in May and will not end until 1995.

Nippondenso hopes to use the local net to establish an automation system that covers every aspect of manufacturing, from order-taking to delivery. "We are tilting toward MAP as a factory automation protocol that may become the international standard," a Nippondenso spokesman said.

Nippondenso, a Toyota Motor Corp. affiliate with 1985 revenues of $5.8 billion, is prepared to develop, by itself, the MAP-compatible computers, communications equipment, robots and machine tool controllers needed for the new factory. Some of that new equipment will be supplied by AB Denso Corp., a joint venture that the company established in 1984 with Allen-Bradley Co., a U.S. factory control system maker.

Nippondenso's move is expected to push other Japanese industrial manufacturers closer to MAP support. Several Japanese manufacturers — including Fanuc Ltd., a robotics maker, and Omron Tateisi Electronics Co., a factory automation vendor — have already announced plans to test MAP for use in their networking products.

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▶ MULTIVENDOR NETWORKS

Software links IBM PCs, Stratus minicomputers

Two-piece package allows users to toggle between the micro and the mini, back up files and share peripherals.

BY JIM BROWN
New Products Editor

MARLBORO, Mass. — Stratus Computer, Inc. last week introduced software to link IBM Personal Computers to its line of continuous processing minicomputers. Called PC/Connect, the two-piece package supports communications, file transfers and application sharing between personal computers and a Stratus host over dial-up or dedicated lines.

One half of the package, PC/Connect Term, resides on the personal computer and provides emulation of Stratus' V101 or V102 terminals. When communicating with Stratus hosts running under the VOS operating system, it uses a proprietary Stratus asynchronous communications protocol. PC/Connect Term is packaged in sets of 10 copies to a box and lists for $1,000.

The other half of the package, PC/Connect Host, resides on the minicomputer. It receives requests from the PC/Connect Term package, searches out the needed information, converts it for personal computer use and passes it over the link maintained by PC/Connect Term. A single copy of PC/Connect Host lists for $2,000.

Once the communications link has been established, personal computer users can toggle between personal computer applications and VOS applications. With the PC/Connect package, personal computer users can also back up local files on the minicomputer and share mini peripherals such as a printer.

The product release keeps Stratus in the mainstream trend of linking personal computers to departmental-sized minicomputers. "Making the personal computer connection to mid-range processors like Stratus is a mandatory requirement today," said George Weiss, project director for small computer services at the Stamford, Conn.-based Gartner Group, Inc., a market research and consulting firm.

As corporate departments obtain more control over their own data bases in minicomputer-based systems, linking the personal computer to the minicomputer becomes more desirable, Weiss said. More and more managers are considering linking personal computers to departmental minicomputers as it becomes increasingly difficult to manage the micro-to-mainframe links in a corporation, he added.

▶ INTERNATIONAL

French government OKs union of ITT and CGE

BY AMIEL KORNEL
CW Communications International News Service European bureau

PARIS — France's state-owned Compagnie Generale d'Electricite (CGE) and ITT Corp. received French government approval last week for a joint venture that would create the world's second largest telecommunications firm behind AT&T.

Under the agreement, ITT will merge its worldwide telecommunications, office automation and consumer electronics businesses with a holding company controlled by CGE. The holding company will pay ITT $1.5 billion.

> *"Critics had argued against substantial government funding."*

The holding company will also operate CGE's Alcatel SA telecommunications subsidiary. ITT will own 37% of the subsidiary. It had originally expected to retain only 30% ownership. Majority control of the new firm will be held by a consortium led by CGE. The consortium, which will control 67% of the firm, will include Societe Generale de Belgique, a Belgian banking company, and Spain's telephone company, Telefonica. Based on previous sales of the merging business units, the new firm would have starting annual revenue of $9.8 billion.

Government approval for the plan reportedly came despite continuing objections in some official circles about the venture's financial and economic viability.

Industry minister Alain Madelin said Wednesday that the government would not oppose the project.

The change in the percentage of ownership shared by the partners indicates that the government had offered the newlyweds a dowry that was smaller than expected. Critics of the deal had argued against substantial government funding.

CGE, nationalized in 1982 by the socialist government, is destined for privatization by the recently elected conservative government of Prime Minister Jacques Chirac. The French government last week removed Georges Pebereau, a major architect of the merger, from his post as CGE chairman.

ITT and CGE said they will work out the details of the venture by the end of the year.

▶ IBM 3270 MARKET

ITT bites 3174 bullet

Firm debuts remote cluster controller and enhances its 9000 series line.

BY PAUL KORZENIOWSKI
Senior Editor

TEMPE, Ariz. — In an effort to bolster its No. 2 position in the IBM 3270 plug-compatible market, ITT Courier Terminals Systems, Inc. is expected to respond to IBM's recent 3174 introduction by debuting a remote cluster controller and enhancements to its existing 9000 series controller line this week.

However, analysts generally were not impressed with the new offerings and doubted that the products would help ITT increase its 8% share of that market.

"Plug-compatible vendors have to beat IBM's price or features," said Patrick Gordon, an analyst at The Yankee Group, a Boston market research firm. "The ITT product was late to market and costs as much as IBM offerings."

The new ITT 9425 supplies four to 32 ports and is designed for small remote offices. The product works with applications that use extended data streams and support Synchronous Data Link Control, Binary Synchronous Communications and X.25 protocols. The controller includes an RS-232 interface, which supports data transmission speeds of up to 19.2K bit/sec. It can be configured to support transmission speeds of up to 64K bit/sec.

> *"ITT's product was late and costs as much as IBM offerings."*

Devices that can be directly attached to the box include the ITT 9210 and 9230 terminal series and various ITT printers. Special adapters can connect Ascii terminals, IBM 3270 Personal Computers, IBM 3290 and 3179G terminals and various multiplexers and controllers. Plug-compatible controllers typically only support the vendor's own terminals. ITT has been able to open its box up to some IBM devices, and the company plans to broaden the breadth of products that the controller line can support, according to industry analysts.

Each controller port is able to support two Systems Network Architecture sessions, and users are able to toggle between sessions by pressing a function key. Shipments of the controller are scheduled for this month, with prices ranging from $3,500 to $13,000.

In addition to the remote cluster controller, ITT is expected to unveil two microcomputer-to-mainframe links, which are designed to attach ITT Xtra Personal Computers to IBM hosts through the ITT controller line. The links stem from an agreement that the company signed with Digital Communications Associates, Inc. of Norcross, Ga.

The ITT Irma 95437 card and the ITT Irma 7580 include plug-in ports to ITT controllers, IBM 3278 terminal emulation software and file transfer routines. The products are expected to cost $1,195.

ITT also plans to add a protocol-conversion feature that enables the controller to work with Ascii terminals. The ITT 94100 Ascii Device Adapter enables an Ascii terminal or a microcomputer mimicking a Digital Equipment Corp. VT100 or VT200 terminal to communicate with an IBM mainframe. The adapter supports up to eight Ascii devices transmitting at speeds from 50 to 19.2K bit/sec. The adapter is expected to cost $3,895.

Gordon said the protocol-conversion feature's expected availability should help ITT because the IBM 3174 will not be able to support Ascii terminals until the middle of next year.

The company is also scheduled to introduce "coax savers," which work with IBM 3270 series or ITT 9000 series terminals. The ITT 94823-C enables two terminals to operate simultaneously over one coaxial cable connected at distances up to 4,000 feet away from a controller.

The ITT 94823 connects two terminals over one twisted-pair wire to a controller located up to 1,500 feet away. The adapters are expected to cost $199 per pair.

With these announcements, the 9000 series controllers will include a compatible subset of IBM's Response Time Monitor, which measures terminal response time between the displays and a host. It will be the first time ITT has offered such an option.

▶ TRANSACTION PROCESSING

Tandem to unwrap board-based controller

6105 designed to be compatible with Nonstop processors and support up to four communications lines.

BY JIM BROWN
New Products Editor

CUPERTINO, Calif. — Tandem Computers, Inc. is expected to announce today a new board-level communications controller that will support four different protocols that can be downloaded from the host.

The Tandem 6105 communications controller will reportedly be compatible with Tandem's existing Nonstop II, Nonstop TXP, Nonstop VLX and Nonstop EXT fault-tolerant minicomputers.

The board will be compatible and packaged with two on-line transaction processors, the EXT-10 and EXT-25, also expected to be announced today.

The 6105 supports four communications lines and fits into a single I/0 slot in a Nonstop system cabinet. It is outfitted with four Motorola, Inc. 6809 microprocessors, each equipped with 64K bytes of memory. Called Communication Line Interface Processors (Clip), each microprocessor will retain a communications protocol downloaded from the system's main memory.

By retaining protocols in memory, the controller can be configured to support a mix of bit- and byte-synchronous protocols and asynchronous communications. This enables a single controller to support a range of devices, including IBM 3270-type displays, Tandem terminals, teller terminals, point-of-sale (POS) devices and host systems from other vendors.

> *"The board supports IBM's SDLC and BSC protocols."*

The board supports IBM's Synchronous Data Link Control and Binary Synchronous Communications protocols, as well as additional protocols typically used with POS and other specialized transaction-processing terminals.

It can also support communications over IBM's System Network Architecture, X.25 public packet-switched nets and other networks, Tandem officials said. They pointed out, however, that the controller is designed to work best with polling protocols.

Downloading communications protocols to each Clip allows for easy network reconfiguration, Tan-

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dors with its success in selling voice message systems, but has still lost business to Octel and other companies that sell voice message switch add-ons. Dustin Sykes, vice-president at the Palo Alto, Calif., office of Vanguard Telecommunications, Inc., a voice mail market research company, said Rolm is king of the voice messaging hill.

But Octel's own success has often come at Rolm's expense. "In every case where our customers evaluated Phonemail and Aspen, the Octel product was the clear-cut winner," noted Robert Callahan Jr., vice-president at Callahan & Associates, a consulting firm based in Fairhope, Ala.

A large percentage of Octel's sales have come from Rolm CBX users, according to Sykes, although Aspen does run on other PBXs, such as those made by Northern Telecom, Inc., Mitel, Inc., Siemens Communications Systems and Intecom, Inc. Rolm sells its voice messaging system only with its private branch exchanges.

Octel's continued success selling to Rolm's installed base is dependent in large part on its ability to integrate with Rolm's switch, a capability that other vendors lack. This capability could be jeopardized by Rolm's discontinuance of the ETS telephone line.

Integrating a voice messaging system with a PBX, as opposed to simply interfacing the two systems, provides two key benefits. First, integration enables the voice message system to notify users of message delivery by lighting a lamp on a telephone or giving a broken dial tone. Second, calls are automatically forwarded from busy or unanswered extensions to voice mailboxes.

Besides lacking message notification features, systems that are only interfaced to PBXs require callers to key in the user's extension to reach a mailbox. This can alienate users because it presumes the caller knows the extension.

Some analysts speculated that Rolm's decision to discontinue the ETS line was a practical business decision made to replace an aging technology.

"I doubt that too many people are upset that they are phasing out the older handsets," noted Susan Lehto, senior analyst at The Yankee Group, a Boston market research firm.

The ETS products were first introduced in 1978. Rolm's most recent digital handsets, Rolmphones, were brought to market in 1983. The existence of the newer handsets, which are more reliable and contain more features than the ETS line, contributed to the decision to phase out the older sets, according Ian Angus, president of Angus Telemanagement Group, a PBX consulting firm in Toronto.

Octel, however, knew what it was getting into when it married Aspen to ETS. Aspen was announced two years ago, one year after Rolmphones were introduced. Octel could have chosen to integrate its line with Rolmphones instead of the ETS line.

Angus said Octel probably decided to integrate Aspen with ETS sets instead of Rolmphones because it was simpler to emulate that product. ETS uses an analog signaling technique that is easy to duplicate. Rolmphone uses an unpublished proprietary digital signaling technique. Octel could end up in legal trouble if it tries to emulate the proprietary Rolmphone. Companies such as Northern Telecom have published their specifications, which enables Octel to integrate Aspen with their offerings.

Octel's Torrey claimed that the company will offer a new voice messaging system compatible with Rolmphone, but declined to set any timetable for that product or to discuss its possible specifications.

Aspen users may be able to scrape by with existing equipment. According to Ruth Brinson, manager of voice communications at Deposit Guaranty National Bank in Jackson, Miss., the bank could move some of its ETS equipment from an automatic call distribution group to dedicate the equipment to Aspen. The switch would enable the bank to support its voice messaging users for at least two years.

Customers may also opt to stockpile ETS equipment. A Rolm spokesman said that customers can order ETS products for existing CBXs until the end of next year.

Customers most likely to be caught in a bind are Aspen users who had planned to add another CBX and Aspen system. One user had planned to place an Octel system in a new building, but will be unable to do so because Rolm will not supply ETS devices for new CBXs.

ETS sets and interface cards will continue to be available from third parties. ◻

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"ABC membership applied for" ABP

▶ RATES

FCC puts a halt to increase in access fees for new private-line service

Action is in response to Bell Atlantic's proposed tariff hikes.

BY MICHAEL FAHEY
Staff Writer

For the second time in as many weeks, the Federal Communications Commission temporarily suspended a proposed special access tariff increase that would have raised the cost of the local channel portion of private-line service.

The local channel is the part of a private line that connects a long-haul carrier's point of presence within a Bell operating company's territory to a customer's premises. The local channel is provided by the BOC, which charges long-distance carriers that use its facilities. The long-distance carriers pass that cost on to their customers.

This latest action by the FCC halted a proposed increase in special access tariffs by Bell Atlantic Corp., which was slated to go into effect Aug 1. A week earlier, the FCC halted a similar hike proposed by Nynex subsidiaries New York Telephone Co. and New England Telephone.

The proposed rate hikes by the Nynex companies, which would have gone into effect on July 24, were challenged by the Ad Hoc Telecommunications Users Committee, which represents some of the largest users in the U.S. It claimed the two BOCs were not able to justify the increases. Bell Atlantic's proposed hike was challenged by US Sprint Communications Co. and AT&T, who argued that Bell Atlantic also failed to provide data justifying the requested increase.

The Ad Hoc Committee did not file objections to the Bell Atlantic request because the group is not able to keep up with all of the proposed changes affecting users, according to Ad Hoc Committee Counsel James Blaszak. However, Blaszak and William Pomeroy, Ad Hoc Committee chairman, argued that approval of the pending rate hikes in either case could have wide-ranging, negative consequences for large network users.

Pomeroy, who is manager of communications public policy with General Electric Co., said, "If the big users are not aware of this issue, if they are not tracing it, they are just not doing their jobs."

According to Pomeroy, there is a growing fear among users that the BOCs will use the increased special access charges to move customers away from private-line service to switched access service. He maintained that the goal of this migration policy is to have a captive audience when and if the BOCs are allowed to offer inter-local access and transport area services.

"The Dole bill [the Federal Telecommunications Act of 1986] would take out a lot of the Modified Final Judgment restrictions and move the governing of those restrictions over to the FCC," he said. "The FCC direction has been primarily to deregulate. You know, in some form or another, the local exchange carriers are going to get into the inter-Lata business."

According to AT&T, which planned to pass its share of the proposed special access tariff costs to users, the New England Telephone and New York Telephone hikes would have cost its users up to $40 million this year alone. The Bell Atlantic increases would cost users an estimated $14 million this year.

▶ INDUSTRY SCUTTLEBUTT

GE eyes Japanese mart

CW Communications International News Service
Asian bureau

TOKYO — Speculation is rife here that General Electric Co. is about to form a partnership with seven leading Japanese firms to venture into the lucrative international telecommunications business.

The venture would make Japan's overseas telecommunications market a virtual multinational battleground.

The rumors were encouraged recently when executives from RCA Astro Electronics, which GE acquired in June, visited the Tokyo trading house Nissho-Iwai Co.

The executives from RCA Astro Electronics, the New Jersey-based space satellite division of RCA Corp., reportedly told Nissho-Iwai that RCA wants to work with Nissho-Iwai in the newly formed International Telecom Japan, Inc.

Network nirvana from **page 1**
networking capabilities of their products. Dwayne Walker, a consultant with DMR Associates, Inc. in Glendale, Calif., warns users to read between the lines when perusing literature on local-area network software. "To be [Network Basic I/O System]-compatible doesn't take much. That doesn't really make it a true network, a multiuser piece of software," Walker said.

Although the latest version of Microsoft Corp.'s MS-DOS operating system for the IBM Personal Computer, Version 3.1, contains file- and record-locking functions, many users don't realize they have to implement these security features. "It's easier on the end user if they're using software with built-in locking and read-only capabilities," Walker said. If users tire of manually locking and unlocking files, which Walker says will happen, data will be corrupted.

Of all the applications, data base programs represent the thorniest problems for network users, according to Ferris. Most data bases on the market use a technique whereby records are locked when they are saved, rather than when they are opened. With this method, several users can copy and work on a file simultaneously. However, whichever user saves his updated copy of the file first will have his updates validated. Each subsequent user who tries to save his changes will be told that his copy of the data is invalid.

Although this system may be workable when most data base inquiries are read-only, it can lead to loss of file updates if the data base requires regular updating by several people.

Data bases on networks require careful control. "Administrative procedures have to be established to ensure that the integrity of the data is preserved when you have many people using it," Ferris stressed. Ferris says data administration includes provision of back-up and recovery procedures and development of a vehicle to advise people on the availability of data and how to access it.

Another problem plaguing network users is the development of mysterious conflicts between different makes and types of programs running on a network. DFS Dorland, Inc., a large advertising agency, has had problems maintaining Micropro International Corp.'s Wordstar word processing package and Lotus Development Corp.'s Lotus 1-2-3 spreadsheet program on its Novell, Inc. net.

"We found some corruption going on between Wordstar and 1-2-3 files," said Pat Braden, copy supervisor and resident local net guru at the agency. Braden says Wordstar and Lotus files often end up with the same names on the company's 100-user network. Despite different file name extensions, files from one program are often overwritten or trashed by another program.

Designed as a stand-alone package, Wordstar also has another quirk that poses problems in a network environment: Files do not always close when a user exits, Braden said. As a result, the file cannot be reopened.

Next week: An alternative to Wordstar, a look at file corruption and "The black box problem."

IEEE from **page 1**
optic repeater link is also expected to culminate at the San Diego meeting.

"The 802.3 task force and the 802.3 committee felt the documents for both standards were very stable," Loughery said.

The 802.3 Ethernet standard resembles AT&T's Starlan local network. Starlan was introduced by AT&T last year and is designed to link personal computers, workstations and file servers.

The working paper on the network is known to the committee as the "One-base-five" specification. It describes a low-speed, 1M bit/sec baseband network, which uses telephone-type twisted-pair wire configured in a star topology to support terminals at distances up to 500 meters.

Like Starlan, the network's access method is carrier-sense multiple access with collision detection (CSMA/CD), the same method used in standard 10M bit/sec 802.3 local networks.

The physical layer of the model was altered to transmit at a lower data rate over twisted-pair telephone wire. The network specification is expected to drive connectivity costs down to about $200 or $300 per connection, according to 802.3 committee members.

The "One-base-five" working group consists of approximately 30 members, although AT&T did most of the technical work in adapting 802.3 to the twisted-pair wire environment.

The Fiber-Optic Inter Repeater Link determines the method used to link 802.3 fiber-optic repeaters at distances of about 1,000 meters. Although repeaters can be linked today using coaxial or fiber-optic cable, the methods vary from vendor to vendor. The new specification would specify the fiber type, fiber size and signaling method used.

Unlike bridges, the fiber repeaters will enable 802.3 networks to be extended beyond the maximum 500-meter limitation. Network bridges do not repeat signals to other network segments if the device sought is on the same cable as the sending device.

Although many manufacturers are already building products to the 802.3 repeater specification, users can expect to see a rash of products emerge as a direct result of the standard's finalization. Specifically, chip manufacturers are expected to announce Starlan-compatible computer interface boards. A standard for the actual fiber-optic repeater was determined last December, but has yet to be published.

The IEEE also discussed the feasibility of developing a product conformance testing program. "There was no decision as to what we will test and how we will test it," he said.

The IEEE will hold a two-day forum for vendors and users in September to evaluate such a testing program.

More than 280 IEEE members attended the conference last week, including more than 60 802.3 committee members.

▶ IMAGE TRANSMISSION

GAO urges newborn network be reviewed

Cost overruns may warrant funds cutoff.

BY NADINE WANDZILAK
Staff Writer

CRYSTAL CITY, Va. — The U.S. Patent and Trademark Office's (PTO) estimated $500 million, 20-year automation plan stumbled recently when the U.S. General Accounting Office (GAO) took the PTO to task on the project and its cost-effectiveness.

Ironically, the roughly two-year-old project will reach a milestone in October when the first Intecom, Inc. private branch exchange is scheduled to be tested on site for image transmission.

The GAO has recommended, however, that no additional funds be allocated for the contract until the project can be reviewed by the Secretary of Commerce. While that review may cloud the automation plans, the PTO is proceeding with testing of its Intecom-based network.

That system is meant to provide for electronic filing and retrieval of patent information. It is also intended to put millions of technical documents at the fingers of patent examiners who research patent applications.

The PTO's quest to automate was initiated by a directive from Congress in the early 1980s that required the agency to devise a master plan to automate the agency to the maximum degree possible, according to Jeff Cochran, director of systems engineering and telecommunications for the PTO.

To that end, the PTO awarded a contract in 1984 to Planning Research Corp. of McLean, Va., to devise a strategy.

Planning Research responded with a proposal to use a fourth-generation digital switch as a local-area network.

The Intecom IBX S/80 was selected because it was the only choice that could provide the data throughput to support the intended application, Cochran said.

The PTO intends to use the IBX to support custom workstations to support the agency's data and image communications requirements, Cochran said.

The IBX provides 512 nonblocking ports at 1M byte. The first IBX 80 was installed in the fall of 1985. The year-long image support test slated for October is intended to show the effective throughput the PTO can expect from the Intecom switch, Cochran said.

Images will be transmitted on a test basis from a data base in the agency's computer center to a patent application examination group with 28 workstations in a building 3,200 feet away. The data base contains the full text of all patent documents from 1975 to the present, Cochran said.

Fiber-optic trunks have been installed between the IBX and Intecom Interface Multiplexer switch module used to support those remote workstations. The workstations are connected to the Interface Multiplexers with either coaxial or twisted-pair wire.

The PBX connects to an IBM-compatible National Advanced Systems mainframe via an IBM mainframe channel. Images are stored on optical disks that are controlled by a subsystem connected directly to the IBX.

Although progress has been made on bringing part of this system up, the GAO is critical of the PTO's efforts. The report the GAO issued last month claimed, "Millions of dollars have been spent with little assurance that the office is implementing the best alternative for improving operations." The report went on to say, "The program is over a year behind schedule, and additional delays are expected."

PTO plan delays cited

While the PTO began to implement its automation plan in 1982, the system was not operational as of April 1986, according to the GAO.

That office said the PTO is scheduled to complete its testing and evaluation of automated patent searching capabilities by December 1986.

The GAO report recommends that the Secretary of Commerce reassess the direction and scope of the project.

The report claims that the patent office failed to document cost alternatives and failed to have a space management study done as required.

Cochran had no comment on the GAO report, saying no official response has been made.

He did, however, offer comments on the ongoing project, saying, "We've had a software problem with one workstation talking to another workstation device."

The system can accommodate 3,200 workstations, according to Cochran.

The agency reportedly plans to connect some 1,800 workstations concentrated in three buildings within a two-mile radius and four other sites.

▶ PUBLIC SERVICES

N.J. Bell pushes new PDN, CO LAN and DCS

BY KARYL SCOTT
Washington, D.C. Correspondent

NEWARK, N.J. — New Jersey Bell officially announced three digital telecommunications services here last week and signaled the beginning of an aggressive new plan to take them to market.

The Bell operating company showed its Public Data Network (PDN), Central Office Local-Area Network (CO LAN) and Digital Connect Service (DCS) at a media briefing here last week. On hand were representatives from CompuServe, Inc., First Jersey National Corp. and the Jersey City State College, first users of these new services.

While BOC local networks based on central office switches and new packet-switched network services have been highly publicized lately, this is the first month New Jersey Bell has been allowed by the New Jersey Public Utility Commission to offer these services.

Several other BOCs are awaiting similar regulatory approval of their CO local networks and packet-switched service options.

BellSouth Corp. and Southern New England Telephone Co. currently offer packet-switched network services.

New Jersey Bell's PDN is a two-way packet-switching service providing protocol conversion between asynchronous communications and syncronous X.25 and X.75 protocols. Customers access the service over dial-up local exchange lines at data rates up to 1,200 bit/sec. Dedicated access links can support speeds up to 9.6K bit/sec. For high-speed access at up to 56K bit/sec, users must use digital facilities or New Jersey Bell's DCS.

CompuServe is using PDN in New Jersey to provide data base access to its in-state customers, according to John W. Seazholtz, vice-president of sales at New Jersey Bell.

See **New Jersey Bell** page 42

▶ $4.5 BILLION CONTRACT

Boeing to forge FTS bid

New coalition planned for pursuit of jumbo federal telecom system contract.

BY KARYL SCOTT
Washington, D.C. Correspondent

SEATTLE — Boeing Co., Inc. recently announced plans to create a team of telecommunications companies led by Boeing Computer Services Co. to bid for the $4.5 billion Federal Telecommunications System (FTS) 2000 contract.

The partners are expected to be announced within the next few weeks, and some observers speculate that AT&T could be one of them. AT&T, however, is also expected to bid for the FTS 2000 as a prime contractor. The long-distance carrier built the current FTS network.

In its bid, Boeing would provide systems engineering and act as a network integrator. Boeing officials said they have held discussions with AT&T, MCI Communications Corp. and US Sprint Communications Co. regarding long-distance services for the FTS 2000 bid. The long-distance companies declined comment.

Telecommunications analysts who have long expected Boeing's announcement say the FTS bid is a logical move for the company as it attempts to diversify from its defense business to computer and telecommunications services.

Boeing is the second company to announce its intention to bid for the 10-year FTS contract. Martin Marietta Corp. recently revealed that it would team up with Northern Telecom, Inc. and all seven of the regional Bell holding companies to bid for the FTS 2000 contract ("Coalition seeks huge FTS contract," *Network World*, July 21).

Boeing says it will use its expertise as a large-scale systems integrator in its attempt to win the lucrative FTS contract. The company, a major defense contractor in aviation and electronics, has been involved in three major telecommunications projects. The most recent one involved a 1984 contract with the National Aeronautics and Space Administration for the design and implementation of a network that supports voice, circuit- and packet-switched data, facsimile and video capabilities. The first phase of the project, which involved 70 subcontractors, was completed last April.

Boeing also developed a voice/data telecommunications system for the Commonwealth of Pennsylvania. Control of the network has been turned over to the state, which owns all the facilities.

Unlike the Pennsylvania network, the FTS 2000 will be the property of the prime contractor. As its user, the federal government will buy network services rather than own the network.

In its bid, Boeing will also draw from experience it obtained from the design of its own internal telecommunications network. That system links five data centers in the U.S. in addition to all Boeing divisional headquarters and sales offices. The internal network uses a combination of terrestrial and microwave transmission facilities.

The General Services Administration, which is the federal agency overseeing the FTS contract, is expected to issue a draft request for proposal (RFP) in August and the final RFP in November.

▶ INTERNATIONAL

Comsat enters pilot Vsat net venture in UK

Teams up with UK-based telecom firm.

BY KARYL SCOTT
Washington, D.C. Correspondent

CLARKSBURG, Md. — Comsat Technology Products, Inc. has entered a pilot program with Mercury Communications Ltd. in the UK establishing three very small aperture terminal (Vsat) private satellite networks in a bid to bring its Vsat technology to the UK market.

The pilot calls for Mercury to build networks for Electronic Data Systems' (EDS) UK operation, IBM U.K. Ltd. and the London Stock Exchange.

Mercury, a division of Cable and Wireless PLC, is a public telecommunications company that competes with British Telecom International, Inc., the former state-owned monopoly that was recently transferred to private ownership.

Under the agreement, Comsat will provide its Starcom 1.2-meter earth stations to the three Mercury customers in a 10-week pilot program. If the test is successful, "we expect more business from all of the parties concerned," said Charles Zito, vice-president and general manager of the Network Products Division at Comsat.

EDS, IBM U.K. and the London Stock Exchange will use their private Vsat data networks in place of Mercury-provided terrestrial communications facilities in the UK. EDS will use its Starcom network to support computer-aided design and manufacturing applications; the London Stock Exchange will use its network to disseminate stock quotes; and IBM U.K. will use the technology to support 3270 applications. In each case, the Vsat networks will link remote locations with a centralized corporate office.

Comsat will provide the transmission gear and Vsat antennas and work with Mercury and its customers to design the networks and develop user applications.

Mercury will provide the radio gear and the six-meter master earth stations to be used in each of the star-configured networks. The master earth stations, or network hubs, will be located at the UK pilot control center at Mercury's Docklands Satellite Communications Center. Mercury will operate and maintain the hubs for the three clients. Mercury will also manage the space segment, capacity it has obtained from Intelsat.

"It was quite a coup to receive this level of interest in our product," Zito said. "Part of the reason we were chosen was for our responsiveness to Mercury's schedule, which will begin on Sept. 8. Another was our technology.

"We believe we are the leader in protocol support and space segment management for Vsat networks," Zito said. Comsat's Ku-band Vsats support IBM Systems Network Architecture's Synchronous Data Link Control protocol, asynchronous Ascii communications and X.25 packet-switching protocols.

Comsat's space segment technology maximizes the network's transmission capacity by enabling a number of earth stations to share a fixed satellite transmission capacity, Zito claimed. With many dishes transmitting to the same hub, traffic problems can occur. To overcome this, Comsat has developed what it calls Random Time Division Multiple Access (TDMA). Random TDMA is said to coordinate the timing of signals between Vsat stations and the hub. At peak transmission times, the Comsat system buffers data at the Vsat terminal until it can get a clear satellite channel, thus eliminating traffic collisions and data loss. If Vsat buffers reach capacity, data can be buffered at the hub.

Starcom, introduced to the U.S. market in 1985, is used domestically by a handful of firms, including Halliburton Corp., the Texas-based oil exploration company. Like the intended European users, Halliburton's Vsat network replaces dedicated terrestrial facilities. The Halliburton network includes 120 Starcom earth stations.

Zito said that Mercury would beat British Telecom to the Vsat punch with this deal, adding, "We are hoping to interest British Telecom in our technology."

The prime markets for Mercury's Vsat services are expected to include retail firms, petroleum industries, finance, providers of value-added data services and public utility companies. Mercury's Vsat network coverage will be nationwide. The service tariff will be insensitive to distance. Mercury is planning to expand the service to western Europe, according to Comsat.

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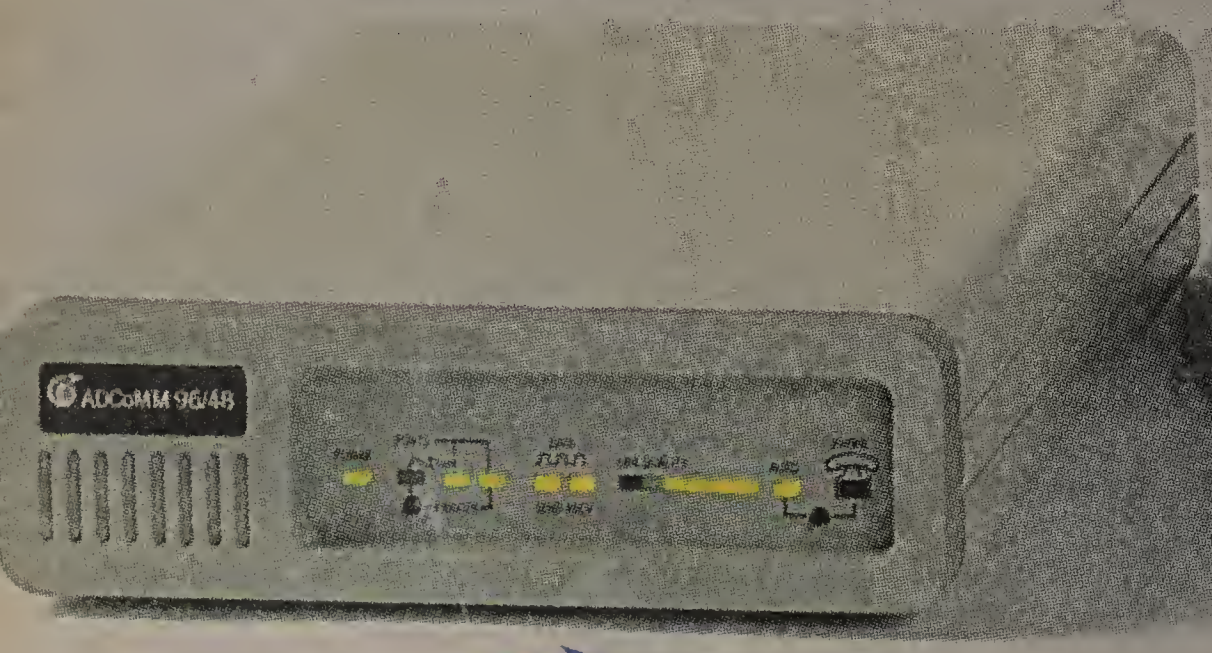

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INDUSTRY UPDATE

Paradyne trial postponed

The U.S. District Court in Tampa, Fla., has postponed until Jan. 5, 1987, the trial for charges contained in the Dec. 12, 1985, indictment of Paradyne Corp. and eight present and former officers and employees. According to Paradyne, the postponement was ordered primarily to allow defendants additional time to seek appellate review of certain *in camera*, or private, proceedings proposed by the court.

ACQUISITIONS 1

Grace buys two more

Ravenous company paves way for national fiber net.

BY MARGIE SEMILOF
Senior Writer

LAKE OSWEGO, Ore. — Grace Communications, Inc. furthered its ambitious plan to build a national fiber-optic-based, long-distance network by announcing last week the acquisition of National Telecommunications Corp. (NTC) and Century 21 USA.

Both buy outs are part of an extensive acquisition program announced by Grace Communications' parent corporation, Grace Capital, Ltd., a Portland, Ore.-based wholesale investment banking firm specializing in leveraged buy outs and resource management. Grace Capital has holdings in such diverse industries as real estate and high-cost capital equipment.

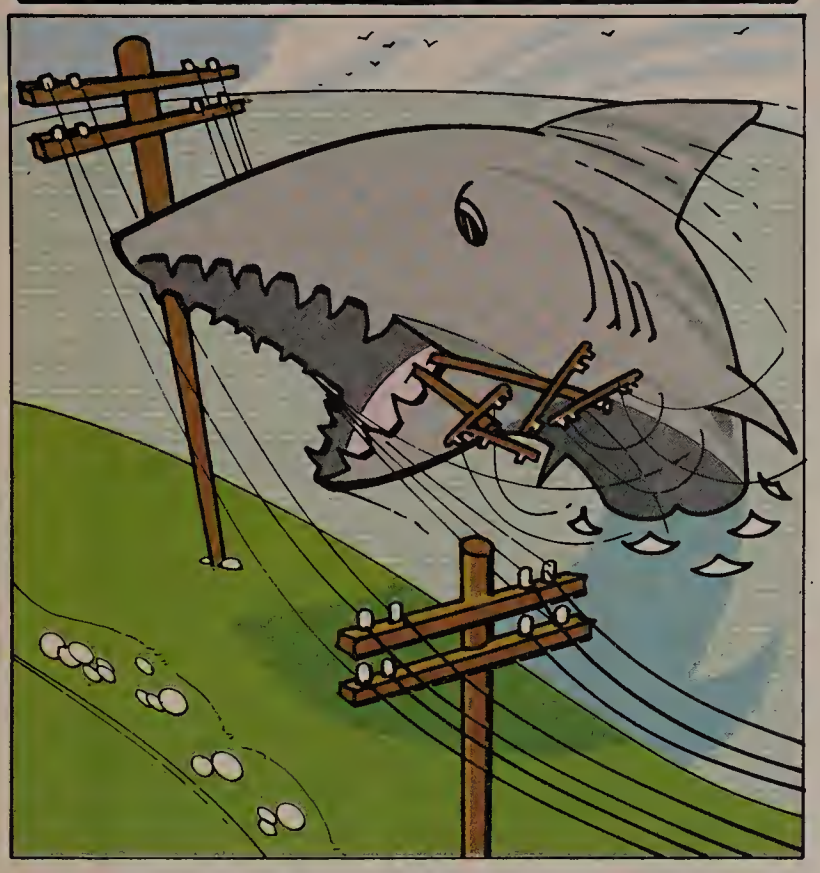
The company's goal is to purchase interexchange carriers along its planned fiber-optic routes. Grace Communications will piece together the fiber-optic network by interconnecting regional networks and circuits leased from large carriers. It also plans to route traffic through fiber-optic reseller company acquisitions.

According to Larry Stockett, former president of NTC and current president of Grace Communications, the company hopes that 70% of its customer base will come from Fortune 100 corporations that currently own their own national networks, and from reseller company customers. The remaining 30% of its customer base would be users looking for an alternative to private-line or Wats-like traffic.

"Our primary business will be supporting a network that brings fiber to the door of Fortune 100 companies," Stockett said. "These customers have enough monthly transmission to justify such a service."

Stockett said Grace Capital is raising $100 million in venture capital for the two long-distance reseller acquisitions, and it plans to lease fiber-optic circuits from major carriers such as Lightnet, Inc. Lightnet is a fiber-optic transmission provider jointly owned by

Grace gobbles up resellers



CSX Corp. and Southern New England Telephone Co. Grace Capital plans to buy a total of 10 resellers in various cities to serve as switching centers for the network's backbone.

Once that backbone is in place, the company plans to acquire additional resellers and consolidate all traffic through the original 10 switch centers.

"We won't use those additional resellers' switches," Stockett said. "We plan to haul extra traffic to the first 10 switch locations to fill the circuits we are buying around the country."

Grace Communications is currently leasing circuits from 23 different fiber-optic carriers in 105 local access and transport areas. The company plans to interconnect about 50 carriers in all 200 Latas by year end.

Grace Communications will be competing for the same customer base as AT&T, MCI Communications Corp. and US Sprint Communications Co. However, Stockett said his network will provide a single-source fiber-optic link to all parts of the country. Most large carriers' fiber-optic networks are geographically limited, and users are often forced to purchase links for remote locations from smaller, regional carriers, he maintained.

"Aside from AT&T, there is no company that can

See **Grace** page 10

ACQUISITIONS 2

Icot buying INS for its LAN links

BY MICHAEL FAHEY
Staff Writer

Icot Corp. last week signed a definitive agreement to acquire Integrated Network Systems, Inc. for one million shares of Icot common stock.

Icot, based in San Jose, Calif., manufactures data communications equipment, including workstations and terminals, line concentrators, protocol converters and X.25 pads. The company's equipment is sold to airlines, banks, retail chains and OEMs.

Integrated Network Systems, Inc., headquartered in Mobile, Ala., manufactures data communications products that allow personal computers to communicate, access and transfer data through IBM Systems Network Architecture and international X.25 networks. The company provides SNA and X.25 gateways that allow personal computer users attached to IBM Token-Ring, Ethernet and other local-area networks to communicate and access remote data bases.

"We need to be able to communicate and interconnect to various types of local-area and wide-area networks," said Arnold Silverman, Icot president and chief executive officer.

"Our company has been very strong in interconnect for wide-area networks. [Integrated Network Systems] will bring us the technology to enhance our wide-area connection, but it will also add the local-area connections such as the [IBM] Token Ring."

PROFIT AND LOSS

Ungermann-Bass, Inc. cited sluggish sales in domestic factories, OEM customers, federal agencies and Japanese communications markets as the culprit behind a net loss of $3.897 million, or 23 cents per share, for the second quarter in 1986. The local-area network manufacturer reported losses of $1.310 million, or 8 cents per share, during the similar quarter in 1985.

Sales figures during the second quarter of 1986 also dropped 31%, to $7.7 million, from $11.2 million in the first quarter of 1986. The company also reported that sales to end users in the U.S. and Europe grew 24%, to $14.5 million, from $11.7 million during the first quarter in 1986. Ungermann-Bass reported net revenues up $4 million, to $22.66 million during the second quarter in 1986, compared with the $18 million tallied during the similar 1985 period.

BellSouth Corp. reported second-quarter net earnings of $408.5 million. The figure is up from the $367.1 million reported during the similar three-month period in 1985. Second-quarter 1986 revenue was $2.9 billion, with expenses for the similar period last year totaling $2.5 billion.

Southwestern Bell Corp. posted second-quarter net income in 1986 of $258.5 million, or $2.60 earned per share, over net income figures of $256.9 million, or $2.58 per share, earned during the similar period in 1985.

Contel Corp. reported a 6% increase in net income for 1986 second-quarter earnings over the similar period last year. Consolidated net income for 1986 is listed at $56.9 million, or 74 cents per share, up from $53.8 million, or 69 cents per share in 1985. Contel reported second-quarter revenue and sales for 1986 at $776 million, compared with $643 million for the similar period in 1985. The 1985 figures do not include revenue from American Satellite Co. and Contel Spacecom, which were not wholly owned by Contel until October 1985.

Infotron Systems Corp. reported sliding profits for the 1986 second quarter over the same period last year. Net income for 1986 was listed at $891,000, or 17 cents per share, well below the $1.316 million, or 26 cents per share, posted during the similar three-month period in 1985. Revenue for the company was posted at $21.664 million in 1986, over $17.873 million during the similar three-month period in 1985.

Grace from **page 9**
provide private-line service in every part of the country," he said. "Users with private networks try to avoid AT&T's high private-line prices by leasing network pieces from smaller resellers.

"By acquiring the unregulated fiber-optic resellers, we can save those companies enough money off-network to induce them to give us some of their private network traffic."

Grace Capital is a relative newcomer to the communications industry. None of the analysts reached for comment had heard of the company or any of its subsidiaries. Stockett explained that Grace Communications courted its potential customers through mailings, but chose to keep a low profile throughout its first year of strategic business planning to avoid drumming up competition.

James Adkisson, a financial consultant for the Portland, Ore.-based brokerage house National Securities Corp., has charted the progress of both Grace Capital and Grace Communications and is interested in investing in them.

"It is not a business plan for the fainthearted," he observed. "And basically, they are betting on [Grace Capital] in this plan. I was initially concerned whether or not the company would have the ability to raise the funds for this venture. Even though it is a complicated business plan, I think they can raise the money."

Stockett said the acquisition of Century 21 USA provided Grace Capital with a $7 million equity infusion of real estate holdings. With these additional assets, the company hopes to obtain $20 million in leverage borrowing over the next 90 days. He said that funding will provide the resources to acquire additional resellers.

Century 21 USA is a small real estate holding company based in Applegate, Calif. The company is unrelated to the nationally known Century 21 Real Estate brokerage firm. NTC is a Salt Lake City-based cooperative of long-distance communications resellers and shared tenant services providers. Both NTC and Century 21 USA were purchased through stock trading.

CONTRACTS

CUPERTINO, Calif. — **Telebit Corp.** announced it has signed distribution agreements in Japan and Australia. The agreements, worth $7 million, are for the sale of 18K bit/sec dial-up Trailblazer modems.

John Swire & Sons (Japan) Ltd. will sell the modem in Japan, Hong Kong, Korea and the People's Republic of China. **NetComm Australia** has signed a $1 million sales contract with Telebit covering both the personal computer card- and stand-alone versions of the modem.

SAN JOSE, Calif. — **Communications Solutions, Inc. (CSI)** and **Sperry Corp.** have signed an OEM agreement valued at $2 million over the next several years.

The agreement calls for CSI to supply Sperry with Unix operating system versions of its Access/SNA APPC and Access/DIA products. CSI software will give Sperry Series 5000 and Series 7000 computer systems access to IBM's Disoss office automation environment.

SAN DIEGO, Calif. — **Systech Corp.** signed a three-year, $10.3 million OEM agreement with **Sperry Corp.** to supply it with Systech's line of Unplug asynchronous distributed multiplexers.

Sperry will integrate the products into its Unix-based Model 5000/80 minicomputers as part of Sperry's $250 million contract to supply the U.S. Army with as many as 1,800 minicomputers during the next three years.

BOHEMIA, N.Y. — **Cyber Digital, Inc.** has sold one of its Simultaneous Data/Voice Networking Switch units to **Leecraft Manufacturing Co., Inc.** of Long Island City, N.Y., for a reported $55,000. The installation will consist of 23 Cyber Digital Integrated Service Terminals, 49 regular telephones, Cyber's MSX Attendant Terminal and a single shelf MSX configuration.

SUNRISE, Fla. — **American Airlines** placed an order valued at more than $6 million for data communications systems from **Racal-Milgo, Inc.** The airline also signed a multimillion-dollar procurement contract for Racal-Milgo equipment and maintenance services during the next five years.

The order includes Omnimode intelligent modems and Communication Management Series network diagnostic and control systems. The equipment and maintenance services support the continued expansion of American's subscriber network of travel agencies on the Sabre international computerized reservation system.

ATLANTA — **Contel Business Networks** announced that Intelsat has renewed its option for continued support for its Intelsat V and VI satellite series network by Contel. Intelsat, a consortium of 110 nations, provides international voice, data and video communications to member and nonmember nations worldwide.

TELECOM TRENDS

Japanese bank giant signs on with Teleport

Normura Securities Co., Ltd., Japan's largest securities and investment banking company, has signed on as a tenant with The Teleport in New York. The company will reportedly build and operate a computer data center in conjunction with Nomura Computer Systems Co., Ltd. The data center will house an on-line computer system that will operate round-the-clock and link company facilities in Japan, Europe and the U.S.

▶ SERVICE ALTERNATIVES

AT&T takes aim at Centrex

New venture is expected to bundle switching with long-distance service.

BY JOHN DIX
Senior Editor

AT&T is expected to launch a service this month that bundles a Centrex-like offering together with long-distance services, according to John Powers, a consultant with the Dedham, Mass.-based firm Telecom Management Corp. Although AT&T is expected to field a dedicated sales team for this new venture sometime soon — including representatives from its long-distance service and equipment divisions — Powers said some large customers have already been approached about the idea.

In theory, AT&T could go after the large installed base of Centrex customers currently served by local telephone companies by offering similar services from the switches in its nationwide network.

But instead of supporting Centrex directly from these switches, where the customer's telephones could be individually wired back to the central office, Powers believes AT&T will install switch modules at the customer's site. These modules would support a customer's telephones as any private branch exchange would, but they would be tightly coupled to AT&T's central office switches through high-speed digital communications links.

The service would not be classified as a true Centrex service because of the need for customer premises equipment, but it would be more than a PBX because of differences in switch architecture and implementation. The idea offers some interesting possibilities.

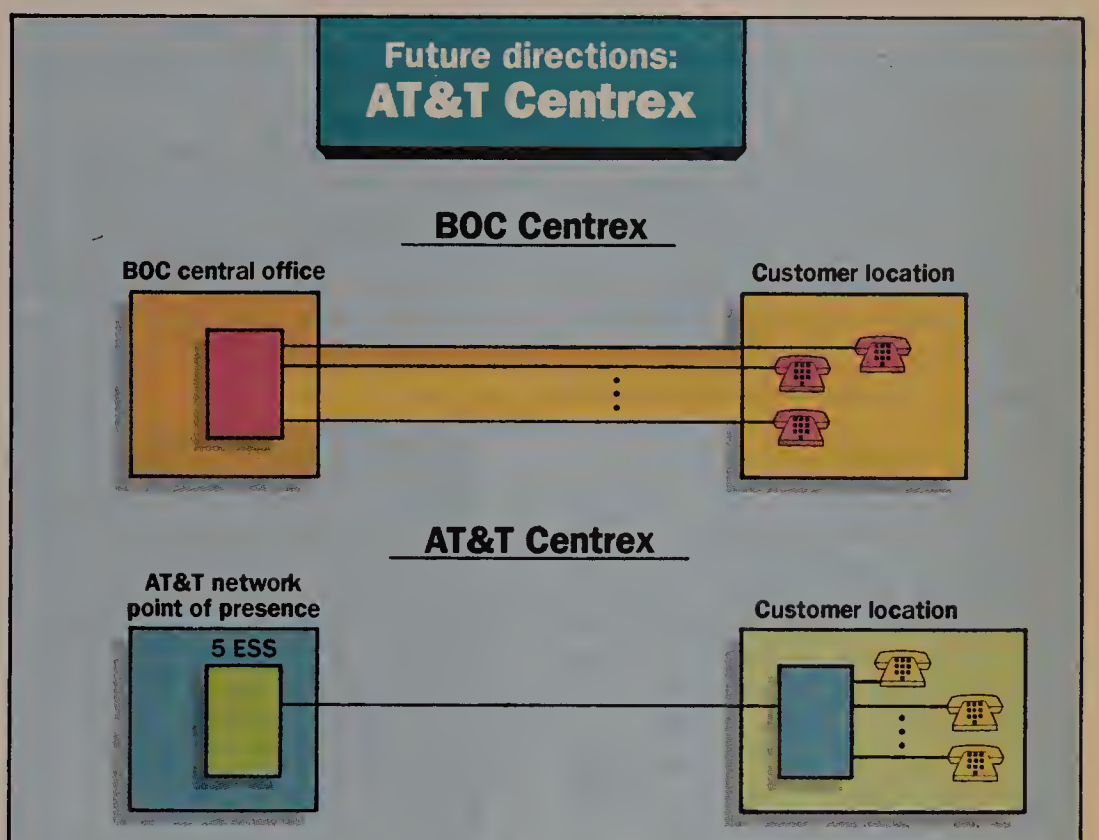
Most significantly, such a service would give AT&T a product to sell to present Centrex customers. Today, AT&T's only hope of doing new business with these customers is to convince them to install PBXs.

The PBX alternative is a less than optimum choice for many Centrex users. These customers include some of the largest corporations, many of which are unwilling to take on the headaches of becoming their own phone companies.

Although it is unclear how AT&T would present this offering, Powers suspected it would be billed as an enhanced digital central office service. Depending on state regulation and tariffs, the remote switching module installed at the customer site may be owned by AT&T or the user.

In either case, AT&T would probably retain maintenance and support responsibilities of the switch module in order to provide

See **Centrex** page 12



AT&T's rumored Centrex-like service would be offered from points of presence normally used as entrance points to its long-distance network. Points of presence outfitted with 5ESS switching systems, the theory goes, would be used to support remote switching modules installed at the customer location. This would enable AT&T to sell systems to Centrex customers that are uninterested in buying private branch exchanges.

▶ PUBLIC NETWORKS

Nynex to test Ericsson central office switch

Nynex Corp. next year will begin testing Ericsson Network Systems' AXE digital central office switching system to gauge its call-handling ability and compatibility with existing telephone network switches, Nynex announced.

Nynex and Ericsson have signed a letter of intent calling for Ericsson to deliver the equipment early in the first quarter of 1987, according to a spokesman for Ericsson, who said the manufacturer had similar agreements with US West, Inc. and Southwestern Bell Corp.

If the equipment meets Nynex's expectations and the company purchases it, it would mark the first time the company has purchased switching equipment from Ericsson. According to the Nynex spokesman, the telephone holding company hopes to use the Ericsson equipment to build an intelligent network that would enable the company to coordinate the software-controlled functions now handled within each remote central office switch from a single remote data base.

CROSS TALK

JOHN DIX

Fiber-optic net may carry Sprint past MCI

US Sprint Communications Co. has 300 crews working around-the-clock, seven days a week, installing a nationwide fiber-optic network that the company hopes will carry it past MCI Communications Corp. to make it the country's second largest long-distance carrier.

Formed by the recent merger of GTE Sprint Communications Corp. and US Telecom, US Sprint is counting on the fiber network for two essential purposes, according to C. Thomas Taylor: to provide high-quality voice transmission services to entice badly needed business accounts, and to expand network capacity for new data communications services. Taylor is senior vice-president of business systems and services for Telenet Communications Corp., US Sprint's data communications subsidiary.

Although he wouldn't speculate as to when his company will achieve its goals, Taylor said US Sprint expects to grow 30% to 40% per year and eventually overcome MCI. MCI reported 1985 revenue of $2.5 billion, compared with US Sprint's anticipated 1986 revenue of $2.1 billion.

To reach its lofty growth goals, the carrier will attempt to win lucrative business accounts by extolling the sound quality of its fiber network. Interestingly, the company will retain the Sprint name for voice services, even though the old GTE Sprint had an industry reputation of offering low-quality services.

The company will try to improve Sprint's tarnished image with marketing campaigns that laud network improvements, mostly the growth in use of fiber optics. Taylor said GTE wrote off $1.3 billion worth of old equipment before the merger to pave the way for network upgrades.

Besides the new image of quality, US Sprint will sell itself as a full-service company capable of offering a range of products. Taylor said Telenet will draw backbone circuits out of the fiber net for its nationwide packet network and use the capacity for new data services. Telenet will offer T-1 1.54M bit/sec facilities and circuit-switched digital services at speeds up to 64K bit/sec.

▶ BRITISH TELECOM

Satellite rates pared

BY JOHN DIX
Senior Editor

British Telecom International, Inc. recently reduced its fixed-term lease rates for Satstream, an international digital satellite communications service that uses small dish antennas to link points in North America with Western Europe.

The price reductions apply to higher speed data services, including 768K bit/sec, 1.5M bit/sec and 2.0M bit/sec links. The new rates, which were scheduled to go into effect Aug. 1, were reportedly made possible by growth in service demand.

Fixed-term discounts will be available for three- or five-year leases and will result in an effective discount rate of 5% to 10%, the company reported.

The discounts will also apply to British Telecom's International Kilostream service, which offers digital leased circuits between the U.S. and other international business centers at speeds from 1,200 bit/sec to 56K bit/sec.

British Telecom International satellite service rates

Speed	Current price	New price
768K bit/sec	£260,000 per year ($32,500 per month)	£240,000 per year ($30,000 per month)
1.5M bit/sec	£340,000 per year ($42,500 per month)	£300,000 per year ($37,500 per month)
2.0M bit/sec	£420,000 per year ($52,500 per month)	£370,000 per year ($46,250 per month)

Exchange rate used is 1.5 dollars per pound. The dollar rates shown are for illustrative purposes. Actual billing will be in pounds sterling in the UK. Price reductions currently apply only to full-time service through a community earth station.

SOURCE: BRITISH TELECOM INTERNATIONAL, INC., NEW YORK

Centrex from **page 11**

the reliability and headachefree appeal of current Centrex systems.

The offering would be unlike Centrex in that AT&T would be able to bundle management of the switching system in with the maintenance and support of its long-distance services. This would be a powerful selling point as long-haul links can be some of the most problematic facilities to maintain. Each line consists of at least two local circuits and an intercity link.

Besides the customer appeal, bundling switching with long-distance service would provide AT&T with the added benefit of locking in long-haul customers. Once installed, use of the AT&T service would probably preempt customers from migrating to other long-distance carriers.

Other benefits aside, this rumored AT&T service may be the only choice for large customers looking for an alternative to their current Centrex service.

Powers maintains that PBXs cannot support more than 8,000 to 10,000 lines. While that line capacity is more than adequate for the majority of customers, there are some Centrex users with larger systems. AT&T's supposed solution may prove to be the only system to handle those jobs.

Powers said that many telecommunications managers of colleges and universities, which are traditionally large Centrex users, told him at a recent conference in Norfolk, Va., that AT&T had been hinting about this service. Most, he added, were receptive to the idea.

If successful, AT&T's gain would come at the expense of the local telephone companies that now offer Centrex. Although Centrex has lost ground to PBXs over the past few years, it still represents an important revenue source to local telephone companies. Customer migration to an AT&T service could strand local telephone companies with investments in central office switches used to provide Centrex.

Presuming the validity and viability of this rumored venture, the Bell operating companies could be further maligned if AT&T installed these remote switching modules using bypass facilities, cutting the local telephone company out of the loop.

▶ MARKET SURVEY

U.S., European users and carriers now beginning to see the ISDN light

ISDN predicted to be a major weapon in the battle between long-distance carriers and the Bell operating companies.

BY JOHN DIX
Senior Editor

LONDON — By the end of 1990, there will be more than 65,000 primary rate access connections to Integrated Services Digital Networks in operation internationally, according to a recent market survey.

Ovum Ltd., a consulting and market research firm based here, predicts there will be some 50,000 primary rate access connections to ISDN in the U.S. and another 16,000 such connections in Europe. In the U.S., primary rate access is based on T-1 1.544M bit/sec digital facilities, segmented into 24 64K bit/sec channels.

Ovum says its installation predictions correspond to roughly 60% of users with large private branch exchanges. ISDN technology could cut by one-half the price those users pay to access communications services, the company claimed.

The study, entitled "ISDN: The Commercial Benefits," says until now, the movement toward ISDN has been driven primarily by technological advances, but adds that both users and carriers are beginning to realize the practical, cost-cutting benefits ISDN will offer. Users will benefit from lower communications costs and improved services, while carriers will win higher revenue from increased use of communications services.

The study goes on to say the main long-distance carriers in the U.S., AT&T and MCI Communications Corp., plan to offer ISDN as a standard means for large users to access their services. That, the report predicts, makes ISDN an important weapon in the struggle between long-distance carriers and the Bell operating companies. Long-distance carriers will rely on ISDN as a bypass tool, while the BOCs will promote the use of advanced, ISDN-based Centrex services. The report says there will be 12 BOC ISDN trials under way by early next year.

> *"The main long-distance carriers in the U.S., AT&T and MCI, plan to offer ISDN as a means for large users to access their services."*

Carriers will initially target ISDN services at three main types of usage:

- Access from PBXs or key telephone systems to the carriers' services.
- Access to advanced Centrex services as an alternative to PBX use.
- As an alternative, in large corporate networks, to leased circuits and private switches.

Across the Atlantic, British Telecom's initial ISDN service, which was launched late last year, will be substantially expanded thanks to significant equipment investments made this year by the company. West Germany has slated an ISDN trial for 1986, and several trials have been held to date in Italy. France's ISDN trial, dubbed Project Renan, is not scheduled to get under way until 1988.

Owing to the progress achieved with standards, the study says, many of the major semiconductor manufacturers have announced chip sets for ISDN interfaces that could ensure low access costs. The companies include Intel Corp. and Advanced Micro Devices, Inc.

The report is priced at $495 from Ovum Ltd., 44 Russell Square, London WC1 4JP, England.

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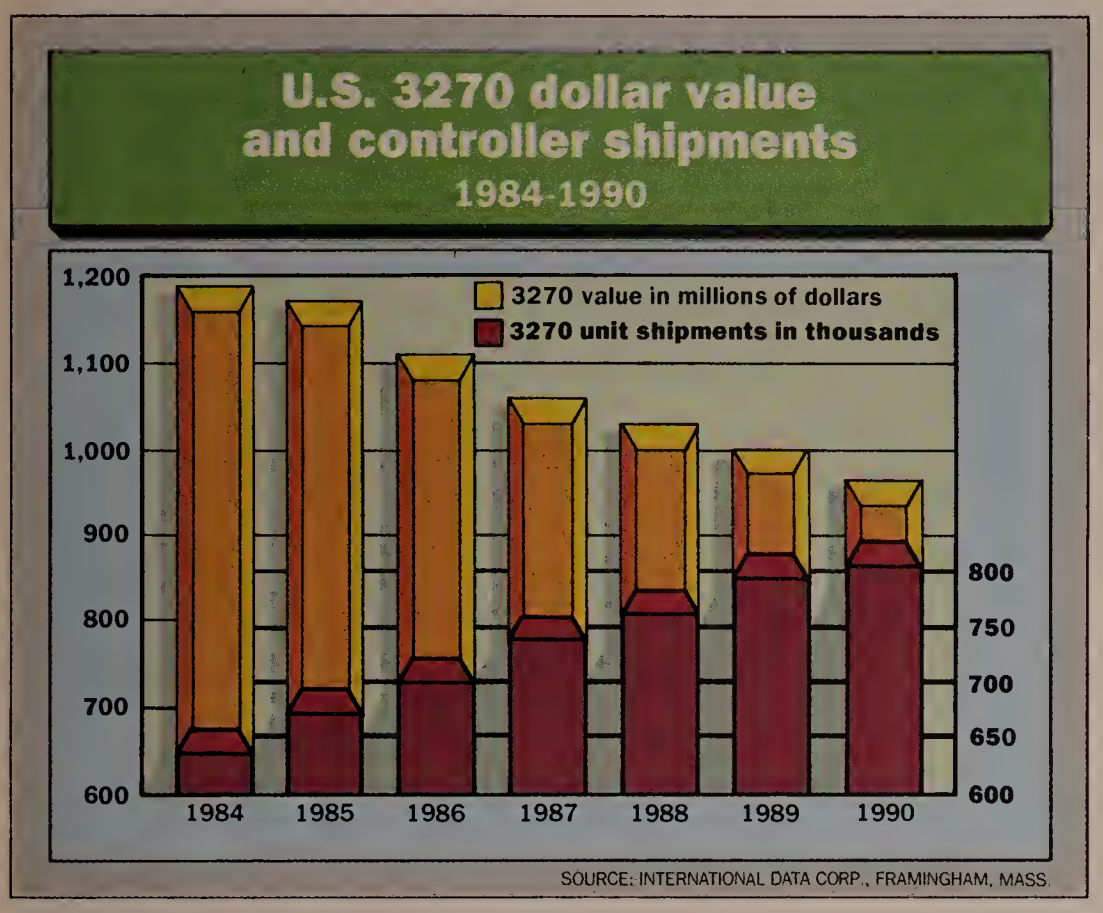
DATA DELIVERY

"I expect every one of the small T-1 multiplexer manufacturers to be purchased within the next 12 to 18 months.

Jeffrey Held
group manager
Network Strategies, Inc.
Fairfax, Va.



DATA DIALOGUE

GABE KASPEREK

Intelligent modems offer a smart alternative

Intelligent modems represent one approach to managing a data communications network. These modems are able to monitor operating environments and transmit information to network control staffs about problems with analog or digital interfaces.

The advantage of this technology is its capability to reduce the size of an operations staff. By using intelligent modems, two network operators are able to monitor a network with 100 drops spread throughout the U.S.

The operators can control remote intelligent modems from a central site because line quality information is gathered from polls at remote locations. This information is then sent to a central facility through a diagnostic channel. A diagnostic channel uses out-of-band signaling, which is separate from main channel data and does not interfere with other information being transmitted.

Out-of-band diagnostics differ from in-band diagnostics. In-band signaling is used with host-based network management systems and interleaves diagnostic and regular messages. Both approaches have shortcomings.

In-band advocates will say that out-of-band signaling relies on some in-band tests, such as loop-back testing. Also, a host-based management system requires only a single connection to the front-end processor and avoids extra cabling needed for some external processors. In-band diagnostics are reliable because messages are sent in the middle of the band, its most stable component.

Out-of-band supporters state that host-based network management eats up valuable CPU processing cycles, and another processor may be needed just to support the network management functions. Also, out-of-band diagnostics work with simple modulation techniques that are not susceptible to noise and other analog impairments on the edges of the band.

Other signaling issues deal with digital services. A number of organizations work with services that transmit digital data at speeds of 9.6K to 56K bit/sec. Whenever a user experiences trouble on a line, he will

See **Intelligent** page 18

Kasperek is president of Kazcom, Inc., a Park Ridge, Ill., network management consulting firm.

NETWORK SWITCHING SYSTEMS

T-1 mux maker under the gun

N16 switch's upcoming beta tests may determine start-up's fate.

BY PAUL KORZENIOWSKI
Senior Editor

ANDOVER, Mass. — The fate of T-1 multiplexer start-up Network Switching Systems (NSS) will be determined in the next several months.

If the beta tests scheduled for this fall and winter are successful, the company stands a good chance of becoming a significant player in the T-1 multiplexer market. If the tests uncover shortcomings in the NSS N16 Switch, the company may never be a significant player in this market.

NSS is one of a handful of start-up T-1 multiplexer manufacturers fueled by venture capitalists eager to make a wad of money in the rapidly growing market. Even though companies such as Network Equipment Technologies Co. (NET) in Redwood City, Calif., and Cohesive Network Corp. in Los Gatos, Calif., have been shipping products for more than a year, NSS has been saddled with problems that have pushed its shipment dates back to July 1987.

NSS made a big splash at last year's Interface and International Computer Association shows with the introduction of its N16 Switch, which can support up to 18 T-1 lines. The company had planned to begin beta testing the product this spring, and production shipments were scheduled for this fall.

Soon after the announcements,

See **N16** page 18

IBM INSIGHTS

Nothing up my sleeve. When IBM announced its new family of cluster controllers, many analysts were disappointed with the 3174's features. The new line had been the subject of numerous rumors, and analysts had said that it would include every conceivable option except for maybe a kitchen sink. As analysts have taken a closer look at the product, they are starting to see the importance of some of the more subtle enhancements.

The new product supports a variety of interfaces, including V.21, V.24, V.35 and X.25. These interfaces are very important in marketing the product overseas. International Data Corp. (IDC), a Framingham, Mass.-based market research firm, said that sales of 3270 products in the international marketplace will be healthier than those in the U.S. throughout the remainder of the decade. IDC also said that IBM made some microcode changes in the 3174 that make it more difficult for the plug-compatible vendors to build look-alike devices.

We don't need it. Even though a number of competitors have controllers that support 64 users and 128 users, the 3174 supports only 32 users. Joseph F. Wagner, an analyst at Dataquest, Inc. in Cupertino, Calif., said support for the larger number of devices is not a significant selling point. New controller sales will come from their use in departmental computing settings and not from traditional data entry applications and departmental systems that do not have to support more than 32 users.

Clash of the titans? Two years ago, IBM and AT&T were supposed to start slugging it out toe to toe. Thus far, competition between the two companies has been limited. That situation may change before the end of the year. Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, D.C., said that IBM will make a number of communications announcements before the end of the year. He also predicted that AT&T would unveil a new line of computers.

The company's first line, the 3B line, was based on products that AT&T had been using internally for a number of years. Dzubeck expects that the new line will be completely hardware and will represent the best efforts of postdivestiture AT&T.

Intelligent from **page 17**
not have adequate tools to isolate a problem and must surrender himself to the phone company. Digital carriers do not allow side channels and currently do not support in-band diagnostics. Improvements in carrier service may be forthcoming, and recently, vendors have come out with protocol-sensitive digital service units that allow in-band diagnostics.

Recent improvements enable intelligent modems to display pictures of analog parameters such as line sweeps and impairments. An operator can then examine a graph to determine if a line is experiencing any problems. Information can be captured at a central data base and later analyzed. These trends enable companies to use management tools without requiring the skill and time needed to learn how to work with external test equipment, such as data analyzers and transmission impairment measuring sets.

In addition to monitoring a network, modems can be used to restore a failed component. Restoration can be achieved by patching, simple hardware switching, matrix switching or dial backup devices.

Performance monitoring, which primarily monitors response time and similar indicators, has traditionally been excluded from modem network management packages. When examining a modem package, a user should ask the vendor when performance monitoring will be integrated into the current line.

When deciding on a modem-based package, users will also have to determine if they want to work with only one vendor. This approach simplifies network management and control by avoiding the confusion and finger-pointing that typically comes in a multivendor network. Less assistance will be required once the network control system is up and running, because there is less equipment on which people must be trained.

However, most companies have equipment from a number of vendors. To accommodate other vendors' products, some modem manufacturers provide a wraparound box. These boxes sit around other vendors' wares, collect line information and work with out-of-band signaling to send that information to a central site.

These boxes have been criticized because they do not supply a complete picture of line utilization. For example, a wrap box is unable to look inside a modem's equalizer. The importance of these capabilities is subject to debate. Organizations must ask themselves if they really want to know whether second or third harmonics are suppressed at 30 to 40 decibels.

Like their competitors, intelligent modem vendors are attempting to supply users with complete network management and control solutions and bring their entire product line under the control of a central system.

N16 from **page 17**
the company discovered those plans were unrealistic. Alan Zucchino, NSS president, said the person overseeing the production process left the company, which created a void and set back the N16 delivery date. "The person overseeing the process was just not experienced enough to get the job done," Zucchino said. Therefore, a new schedule was not developed until last August.

Analysts speculated that the delays stemmed from the death of the company's vice-president of engineering, John Wagner, who passed away last fall. Zucchino said that claim is not true because Wagner's death occurred after the dates were deemed unattainable. In fact, Wagner actually helped set the new schedule.

One reason NSS is a step or two behind its competitors is the company's late start date. NSS was formed in January 1984, almost two years after NET and Cohesive.

NSS secured its second round of financing with the product announcement last spring. Infotron Systems Corp., based in Cherry Hill, N.J., invested $3 million in NSS in return for an OEM agreement and a piece of the company.

Infotron's investment came at a time of considerable activity in the T-1 market. The rapid emergence of the market's high end surprised a number of established communications vendors, such as General DataComm Industries, Inc., AT&T and IBM, according to Gerald Mayfield, vice-president at DMW Group, Inc. in Stamford, Conn. These big players were forced to establish joint marketing or OEM agreements with the handful of start-up companies.

> *"The T-1 marketplace does not take any prisoners."*

As part of the NSS agreement, Infotron will test the N16 during this summer and fall. N16 hardware has been installed at Infotron, and it is now running demonstration software. Zucchino said full-function software will be sent to Infotron this month, and extensive testing will then be undertaken.

In October, NSS plans to install its multiplexer at Citicorp in New York. NSS officials hope to complete two additional beta tests before next year's production shipments begin.

Zucchino said the company is well ahead of its July shipment schedule, and production shipments could begin as early as April. "I'll be shocked if we don't meet our July shipment date," he said.

According to analysts, that deadline is important because NSS must meet its shipment dates to carve its niche in the T-1 market, which is moving at a feverish pace. "The T-1 marketplace does not take any prisoners," noted Chuck Kanupke, vice-president at Dataquest, Inc.'s Marlton, N.J., office.

The competitive nature of the T-1 market places NSS in a make-or-break position. Typically, beta tests uncover problems that are not apparent when a company tests its own product. Fixing these problems can add months to production schedules. "The company may be looking for a new CEO," Zucchino joked when asked what would happen if the production date slipped by six months or more.

As well as producing a viable product, NSS has to put a nationwide sales and support team in place. The firm is currently in the process of hiring sales and support personnel.

In addition to its own sales staff, NSS will rely on Infotron sales and support personnel. The results of this arrangement are open to question because a similar agreement did not bear the expected fruit. Cohesive had an exclusive one-year distribution agreement with General DataComm. When the contract expired in June, the terms of the agreement were changed because General DataComm did not sell as many Cohesive boxes as anticipated.

Analysts speculated that one reason the target numbers were not reached is because Cohesive and General DataComm compete in the same market. General DataComm is reportedly working on its own high-end system, and the Cohesive box was looked upon as an interim solution. Analysts said the company did not push the box as hard it could have.

Infotron may be in the same situation. Robert Bauer, vice-president of marketing and development at Infotron, said the company will continue to expand its T-1 product line, though there are no immediate plans to bring out a T-1 multiplexer similar to NSS's N16. Since the NSS offering is geared to the high end of the T-1 market, the N16 would be used to turn non-Infotron users into Infotron customers, according to Bauer. He added that existing Infotron customers typically would opt for additions to Infotron's lines, rather than the N16.

NSS is not putting all of its eggs in Infotron's basket. The company would like to sign OEM agreements with a private branch exchange vendor, computer manufacturer, packet switching supplier and local-area network player. Zucchino said talks with a PBX manufacturer have reached a serious stage, while other talks have been less productive.

Future OEM agreements could resemble the Infotron agreement. NSS will seek a third round of financing when it begins production shipments, according to Zucchino.

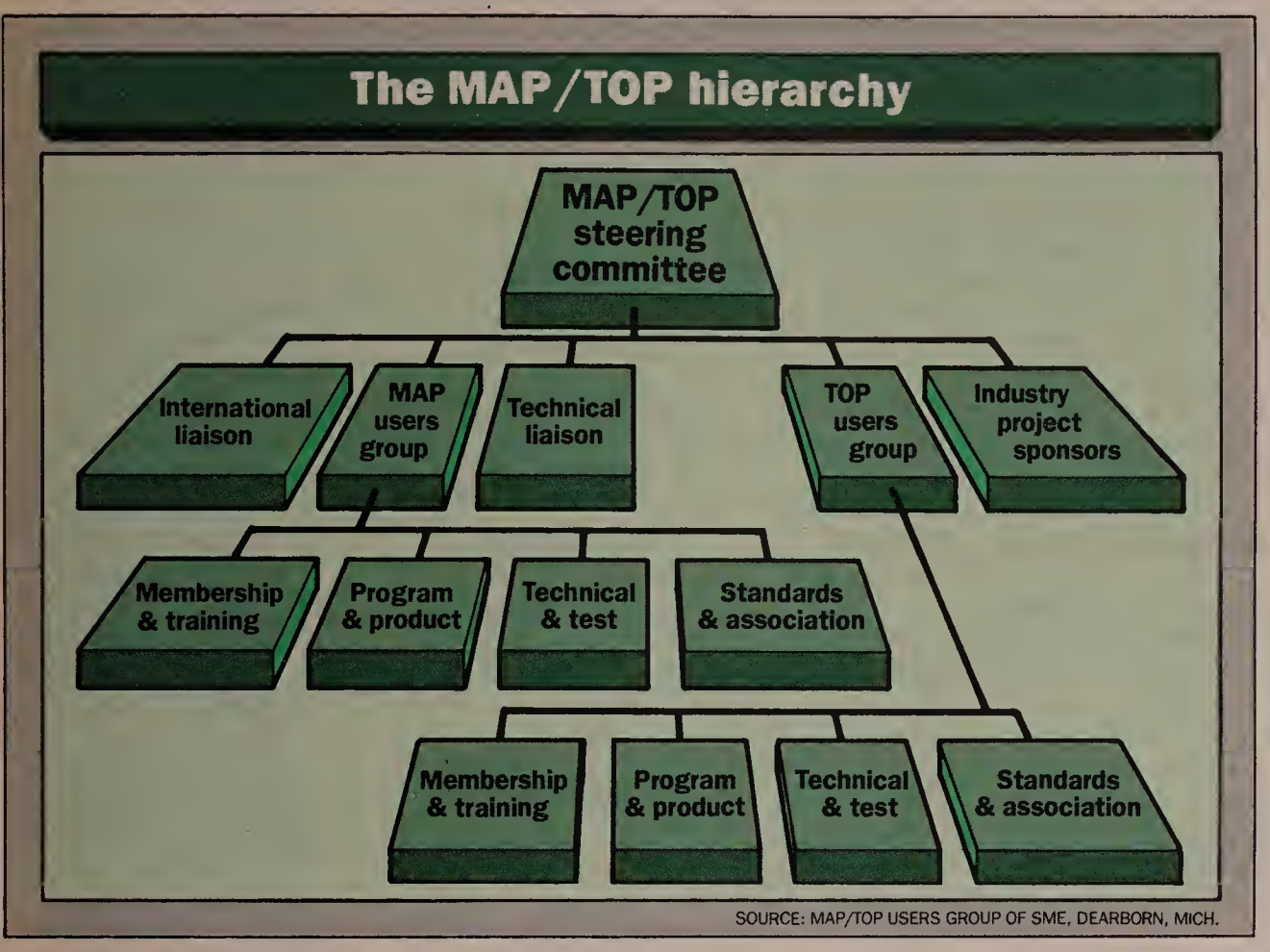
If NSS successfully tests its multiplexer and has the capital necessary to bring its product to market, the company has a chance of becoming a force in the market. "The NET and Cohesive boxes are not perfect, and the NSS offering seems to address those products' shortcomings," noted Andrew Berquist, a consultant at Network Strategies, Inc., a consulting firm in Fairfax, Va. For example, he said the NSS box is more flexible and supplies better network management facilities than its competitors' offerings.

Berquist based his perceptions on sales information supplied by NSS. Until the beta tests are completed, one question will remain. How much of that information will be delivered, and how much of it is merely marketing hype?

FACTORY COMMUNICATIONS

"Inventory is the water in the lake that hides all the rocks. You have to reduce it to locate your manufacturing problems.

Dan Miklovic
MAP project manager
Weyerhaeuser Co.



SOURCE: MAP/TOP USERS GROUP OF SME, DEARBORN, MICH.

FACTORY FACTS

RAJ MELVILLE AND GEORGE KOSHY

Learning the p's and q's of factory floor networks

Second of a two-part series.

Communications within a large, loosely integrated company can be conducted on separate functional networks; different networks may be dedicated to specific functions. Design and engineering may be on a single system, manufacturing on a second and corporate data on a third. These systems may span many buildings within a single site. In addition, links to other corporate facilities must be provided. While noise is a problem at the factory level, it will only affect a segment of the overall network. Facilities that are some distance from the factory floor may not be prone to electromagnetic interference.

While traffic flow at the factory level is erratic in nature, traffic at the upper level will consist of large files and messages. Data handled at the corporate level may also require encryption to ensure the confidentiality of company information. Timeliness of data is critical at the factory level and will require deterministic delays. Upper levels of information are less sensitive to delay. While the large volume of equipment in such manufacturing facilities poses an integration and a compatibility problem, it also provides a larger base of equipment that can absorb the costs of a more expensive system.

> *"With baseband, only one signal is injected into the medium."*

Several technologies are currently available for the implementation of local-area networks. The key attributes that distinguish the different technologies are signaling, medium, topology and access technique.

■ *Signaling technique.* The signaling technique refers to the method of signal transmission used by the local network. There are two significant types of signaling techniques: baseband and broadband.

With baseband signaling, only one signal is injected into the medium. All the frequency components are used to move the signal through the transmission media.

With broadband signaling, multiple

See **Local networks** page 20

Raj Melville and George Koshy are associates at Booz, Allen & Hamilton in Lexington, Mass.

AUTOFACT '87

Procter & Gamble rallies user force

Process manufacturing firms have been slow to give support to the MAP standards effort.

BY BOB WALLACE
Senior Writer

CINCINNATI — Procter & Gamble Co., the nation's largest consumer products manufacturer, is rallying users to create a multiuser-sponsored extension to the planned Autofact '87 live Manufacturing Automation Protocol exhibit that would feature a miniature process manufacturing line.

Bill Veeneman, head of the MAP Process Industry Initiative and a design specialist with Procter & Gamble, said Weyerhaeuser Co., E.I. DuPont Co., Eastman Kodak Co. and Proctor & Gamble have already committed to the effort, which may culminate with a 10-vendor process manufacturing exhibit at the Autofact '87 conference and exposition.

Veeneman is also soliciting user support from such process manufacturers as Mead Paper Specialty Co., Alcoa, 3M Corp., Union Camp Corp. and Exxon Corp. The miniature process manufacturing extension to the MAP communications exhibit will feature commercially available products that are compatible with the yet-to-be-released MAP Version 3.0, Veeneman explained.

Although the factory communications standard has been embraced by several of the Fortune 100 discrete man-

See **Exhibit** page 20

INCIDENTALS

The Center for Professional Development at Arizona State University in Tempe, Ariz., is offering a pair of short courses that deal with manufacturing communications. "Data Communications: An Introduction for the Manufacturing Environment" will be held Sept. 11 and 12. "Manufacturing Automation and the Theory of Network Design and Operation" will be held Sept. 29 through Oct. 1. Both courses will be held on the Arizona State University campus. For additional information on the courses, contact the university at (602) 965-1740.

The Computer and Automated Systems Association (Casa) has announced the availability of four books that deal with various aspects of computer-aided design and manufacturing (CAD/CAM). *New Directions Through CAD/CAM*, a 230-page hardcover book, offers a comprehensive overview of CAD/CAM tools, technology, applications and standards. The book costs $37. *CAD/CAM Handbook*, a 432-page hardcover book, details information aimed at new applications for design, drafting and analysis that are available for every type of engineering and manufacturing organization. *CAD/CAM Handbook* is priced at $49.95. *CAD/CAM Integration and Innovation* describes the step-by-step development of an automated system, including its design, implementation and cost analysis. The book costs $42. *Robotics, CAD/CAM Marketplace*, a 239-page book, features a listing of 6,000 publications, individuals and organizations involved with the CAD/CAM movement. It costs $30. To order any of the four books, contact Casa at (313) 271-1500, ext. 418 or 419.

▶ MAP

Retix, Micom-Interlan sign OEM agreement

BY BOB WALLACE
Senior Writer

SANTA MONICA, Calif..— Retix, a producer of Manufacturing Automation Protocol/Technical and Office Protocol-compatible software, signed an OEM agreement with Micom-Interlan, Inc. that will allow the latter to incorporate Retix software in its networking products. Both companies declined to reveal the value of the pact.

Micom-Interlan also agreed to acquire Retix's Network Basic I/O System interface to the Open Systems Interconnect, MAP and TOP protocols.

Retix, formed in January 1985, signed a contract at the last MAP/TOP users group meeting in May to provide Advanced Computer Communications (ACC) with software compatible with MAP Version 2.1 ("Tools debut at show," *Network World*, May 19). ACC has since announced a software product that allows Digital Equipment Corp. VAXs running Berkeley Unix or Ultrix-32 operating systems to connect to MAP nets.

The Retix software complies with MAP Version 2.1 at Layers 2 through 5, that is, the data link layer up to, and including, the session layer.

Exhibit from **page 19**

ufacturing corporations, process manufacturers have been slow to pledge allegiance to MAP. The need to broaden the scope of MAP to include these huge manufacturers was partially addressed with the creation of the MAP Process Industry Initiative in January. This assemblage was established as a working group under the MAP/Technical and Office Protocol Steering Committee. In May, the group released findings of a white paper that examined the factory communications standard's value to the process manufacturing industry ("MAP study findings uncovered," *Network World*, June 2).

Process manufacturing differs from so-called discrete manufacturing. Process manufacturing is the creation of goods such as paper, camera film or fuel oils from such nondistinct components as chemicals, plastics, petroleums and pharmaceutical elements. Discrete manufacturing involves building a finished product, such as an automobile or an airplane, from a variety of pieces composed of various types of metals and fabrics.

Veeneman said the live process manufacturing exhibition would be designed to prove MAP can be used in process applications. The MAP Process Industry Initiative head said the success of the project would depend largely on the efforts of distributed process control system vendors. This group includes The Foxboro Co., Honeywell, Inc. and Fisher Controls International, Inc. Attaching equipment from multiple vendors to the process manufacturing line and testing to ensure that the different gear will work together will take six to nine months, Veeneman projected. One application currently under consideration for the process manufacturing portion of the Autofact '87 exhibition is a paint production factory.

> *"Many process manufacturers don't feel that MAP is applicable to them."*

> *"Proprietary distributed process control systems solve their problems."*

Weyerhaeuser, a Tacoma, Wash.-based paper products producer, is one of a handful of process manufacturers attempting to spread the MAP gospel through the process manufacturing industry. Dan Miklovic, MAP project manager for Weyerhaeuser, said convincing process industry manufacturers that they need MAP is a tall order. "Many process manufacturers don't feel that MAP is applicable to them. Proprietary distributed process control systems solve their problems," he explained.

"If you run a large facility like a refinery, and the facility is a one-vendor shop, MAP may not be the most effective way to connect the process control system with an IBM mainframe," Miklovic suggested. He added, however, that efforts by various process control system vendors to differentiate their system from one another has catalyzed the need for a communications net capable of supporting equipment produced by several different vendors.

"This need developed because process manufacturing systems vendors are beginning to take leads in incorporating different capabilities in their systems," Miklovic said. "Before these actions began, there was not much product differentiation between a Foxboro system, a Honeywell system and a Fisher system from a functionality standpoint. All three systems performed the same functions."

Miklovic's pro-MAP words are no longer falling on deaf ears. "More and more process manufacturers are beginning to appreciate the need to adopt a system that will allow them to use the best product for each factory function," he said.

"We are trying to convince the user that, for example, if a company uses a Fisher process manufacturing system and wants to add Foxboro products to the system, they will have to wait until both vendors' products become MAP-compatible," Miklovic reasoned. The only other alternative these users have is to wait for their own single system vendor to incorporate what another vendor has added to its process manufacturing system, he said.

> *"Miklovic's pro-MAP words are no longer falling on deaf ears."*

Local networks from **page 19**

signals are transmitted simultaneously. Each signal is confined to a specific band of the radio frequency spectrum. The electronics associated with broadband signaling is far more complex and expensive than the electronics used for baseband signaling.

■ *Medium.* The three types of media most commonly used for local nets are twisted-pair wire, coaxial cable and fiber-optic cable. Twisted-pair wiring can provide only a limited amount of bandwidth and restricts transmission speeds. The low bandwidth precludes twisted pair from using broadband signaling techniques, which would permit the simultaneous transmission of multiple signals.

Coaxial cable is currently the preferred local-area network medium. It offers large bandwidth — 500 MHz to 600 MHz — and it supports broadband signaling. Baseband signaling techniques can also be used on coaxial cable.

> *"Optical fiber is becoming common as a local net medium and may become the most popular."*

Optical fiber is becoming increasingly common as a local net medium and, in time, may become the most popular transmission medium.

Fiber offers many advantages over coaxial cable. These include smaller size, larger bandwidth and freedom from radio frequency interference and electromagnetic interference. The price of electronics for fiber technology is dropping. Concerns about the life span and reliability of the switching electronics are being addressed.

■ *Topology.* Network topology refers to the geographic structure of the local network. The two common types of topology are the bus and the ring.

With a bus topology, the medium is the main trunk to which all devices are attached. A variation on this is a tree-structured technology that has a main trunk with branches, or distribution channels, attached to the main trunk.

Devices, in turn, are attached to the branches. With a ring topology, each station or device is connected with two others through point-to-point links in the form of a ring. A variation of this topology is a star topology, where both the upstream and downstream connections for each device are connected to a central hub.

■ *Access technique.* All local nets employ a technique to allow multiple stations attached to a common medium to share this medium in a controlled manner. The two most prominent access techniques in use are carrier-sense multiple access with collision detection (CSMA/CD) and token passing.

Devices in the CSMA/CD scheme transmit when the medium is free. Transmitting devices also listen to the medium to detect collisions when transmitting. A collision occurs when two devices begin transmitting during the same free interval. When a collision is detected, all transmitting devices attempt retransmission after a random amount of time. The time wasted on detection and retransmission reduces the effective maximum throughput for CSMA/CD.

■ *Token passing.* Token passing schemes distribute the right to transmit by passing a token among the devices. The token prevents contention among the devices and provides some amount of synchronization between transmissions from multiple stations. Token passing can be implemented on a bus topology or a ring topology. Since there are no collisions in token passing, the maximum throughput is higher than that of CSMA/CD schemes.

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NETWORK WORLD

F. Douglas DeCarlo
Publisher
Network World

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We apologize for any unexpected delay in getting your personal copy of *Network World* to you. But you *will* hear from us, so please be patient. And, until your subscription does start, we hope you'll continue to read any available copies of *Network World* for your weekly coverage of the communications-using community.

Sincerely,

Doug DeCarlo
Publisher

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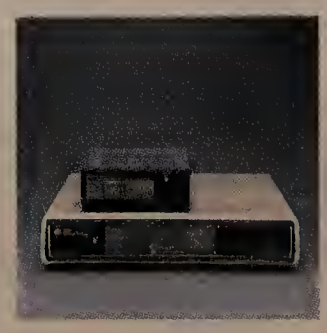

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DATAPHONE II *Network Management Systems* are the nerve centers of the family, permitting you to monitor and manage your network and keep

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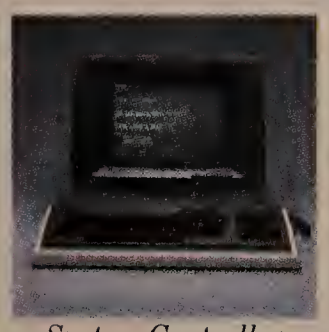

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And why a whole system, rather than stand-alone pieces, is what keeps your network up and running.

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It can have a calming effect on your workplace.

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That's understandable. After all, the heady, anything-is-possible mood of the current marketplace has given birth to a multitude of inexperienced new suppliers.

At US WEST Information Systems, on the other hand, our lineage goes back more than a century. All the way to the earliest days of the Bell System.

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Before your company gets roped in by someone else.

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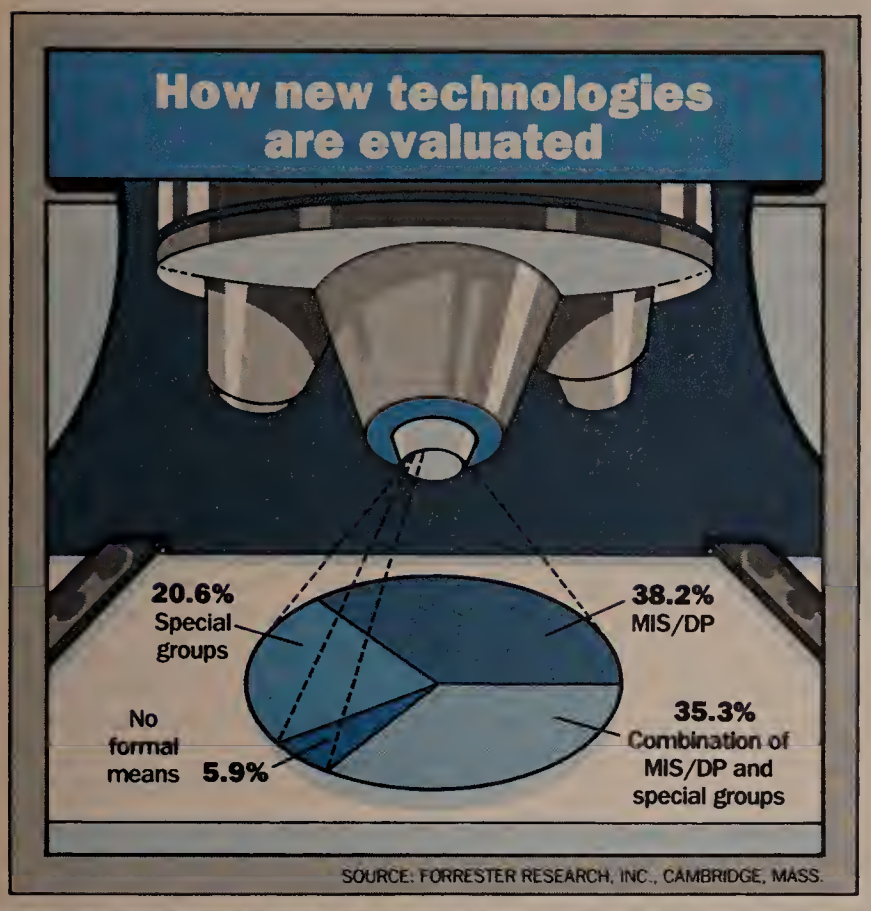
COMMUNICATIONS MANAGER

"One of the toughest aspects of adding new technology in a company is getting upper management consent. Communications managers need a high degree of credibility within their organization — obtained by the success of past projects.

Larry Stouder
information services director
Continental Grain Corp.



▶ LINKING LANS

File server is key to trader's gain

BY MARGIE SEMILOF
Senior Writer

NEW YORK — When a company's bottom-line figures are tallied according to worldwide sales and purchases of commodities such as corn, oats and wheat, it's tough to get a firm grip on their daily positions.

The Information Resources group at the multinational Continental Grain Corp. developed a scheme to help consolidate information in foreign markets onto one financial spreadsheet here. By replacing telex messages, phone calls, mail and several personal-computer-to-personal-computer links with file servers, the company can connect its mix of local-area networks in New York and Geneva, Switzerland. The servers compile information on aggregate purchases and sales of international commodities and futures, giving the company a more accurate, weekly financial fix.

According to Larry Stouder, information services director at Continental Grain, the company runs what it calls an internetwork transient link between continents

See **File server** page 26

▶ PUBLICATIONS

Two handy guides out

Both available to users free of charge.

Micom Systems, Inc. has published a glossary of data communications terms designed for a nontechnical audience. To receive a free copy, write to Mac McCartt, manager of marketing documentation, Micom Systems, Inc., P.O. Box 8100, Simi Valley, Calif. 93062 or call (805) 583-8600.

Mod-Tap System is offering a Communications Wiring System Design Guide at no charge. The guide provides information on the design, specifications and installation of voice and data communications wiring for such equipment as computers, local networks and private branch exchanges.

For more information, write Mod-Tap System, Harvard, Mass. 01451, or call (617) 456-3500.

ASSOCIATIONS

The Southeastern Telecommunications Association (Seta) will hold its 11th annual conference, Sept. 7 through 10 at the Opryland Hotel in Nashville.

John Clendenin, chairman and chief executive officer of BellSouth Corp., will deliver the keynote address on planning for network integration. For more information, contact Seta, P.O. Box 901, Richmond, Va. 23207, or call (804) 746-3195.

Intecom, Inc.'s IBX Users Group will be meeting with representatives from Wang Laboratories, Inc., Oct. 15 through 17, in Lowell, Mass., to discuss the Wang and Intecom merger.

For more information, call Elizabeth Stockwell at (617) 967-5069.

The Telecommunications Association (TCA) released studies that present TCA views on two issues before Congress. One study determines the level of competition in markets that Bell operating companies wish to enter. The other study examines the Modified Final Judgment's lifting of the line-of-business restrictions for BOCs and the possible transfer of communications regulation authority from the U.S. Department of Justice to the Federal Communications Commission.

TCA members claim there is more competition in interstate interexchange services than intrastate interexchange services. Most users complain that there are few practical alternatives to using a BOC.

Regarding the transfer of communications regulation authority and the lifting of line-of-business restrictions, TCA members called for assurance that unregulated, diversification efforts of the BOCs will not be funded at the expense of ratepayers.

GUIDELINES

ERIC SCHMALL

The user friendly fight

The term "user friendly" has the connotation of a used car dealer's proclamation of low mileage. Few phrases in the lingo of the communications industry today draw such skeptical responses from customers.

There are an almost infinite number of stories from users who've struggled through poorly written procedural guides or complexly designed access systems, all of which are supposed to be user friendly.

One of communications management's chief responsibilities is to protect end users from this abuse. This means acting as a faithful sentinel in product selection, as well as ensuring that no internally developed process or procedure involving communications becomes "user hostile."

To achieve this goal, a corporate communications team must set up internal standards for what constitutes user friendliness. In addition, the organization must establish certain testing criteria to determine whether its own processes are acceptably user friendly.

In a more perfectly ordered universe, there might be an industry council to test and label each communications vendor's product with a User Friendly Score (UFS) similar to the federal Environmental Protection Agency reports on gas mileage. One on the UFS scale would indicate product simplicity and assured ease of use; 10 would indicate total product hostility.

In the absence of such an ideal, the communications department must set up some criteria to measure what it regards as acceptable in its organization. This standard should then be applied to each evaluated piece of hardware or software that the end users will encounter.

The overall gauging of user friendliness needs to take the target users' differences into account. For example, a nontechnical group of users may want a modem that has a minimum number of lights and buttons. A more technically adept group of users may regard the absence of these lights and buttons as unfriendly because diagnostics may not be as easily performed.

Internally, the communications department must be equally on guard that it hasn't inadvertently promulgated user-hostile procedures or programs. A technically oriented communications department must occasionally review its own user processes with the

Schmall is network systems manager for an insurance holding company.

See **User friendly** page 26

User friendly from **page 25**

help of nontechnical people outside of the department. The acid test for a procedure is to ask an end user from the target audience to participate in a trial review of the product or process. Using that person's feedback, the department will be able to take corrective action.

By actively reviewing external products' user friendliness and asking nontechnical people to aid in keeping internal communications products and services simple, the communications department will be credited with discharging one of its most important functions — protecting its customers from the confusion and misrepresentation that current so-called user-friendly products carry with them.

File server from **page 25**

using four Banyan Systems, Inc. file servers. The servers are connected via a leased line, which is used for voice during the day.

Each evening, the leased line becomes a data transmission link. The financial information collected by various European operations is sent from individual local-area networks to the Geneva file server. That information is then sent from Europe back to New York, where it is consolidated into weekly updates with other worldwide Continental Grain commodity position information. Stouder said the company's goal is eventually to provide commodity updates on a daily basis.

The company chose the file server scheme because it could link a growing number of incompatible local-area networks. Continental Grain originally used several Ethernet and Datapoint Corp. Arcnet local nets, both of which use carrier-sense multiple access with collision detection (CSMA/CD) as a contention control technique. Continental Grain's MIS directors decided to invest in the IBM Cabling System, which supports the token-ring contention method. The Ethernets and Arcnets will remain in use.

However, the company purchased several Proteon, Inc. Pronet token-ring local networks that were compatible with the IBM cabling scheme. The file server can link the two network types by creating an access method common to both the token ring and CSMA/CD.

Information sharing between unlike local nets on separate continents posed no special problems, according to Stouder. However, it is sometimes difficult to obtain product and technical support for the Swiss installation. Continental Grain employs two technicians in Geneva, one of whom oversees all European networking functions. A third technician will soon be added to the staff in Geneva.

Stouder said he compared his Banyan file server with other server products and options, including the IBM System/36 disk server.

"The biggest difference between the file server and the System/36," he said, "is the System/36 disk server does not offer dynamic space allocation." Disk serving requires a fixed storage capacity to be allocated for each user or application, whereas with file serving, users contend for disk capacity on a usage basis.

Stouder said the file server scheme is also less expensive and faster than the disk server product. Speed is an important consideration in the time-sensitive commodities industry.

The company's Information Systems group is currently reducing the size of each local-area network that ties into the server system. Stouder said by controlling the number of workstations on each local net, his staff can pinpoint networking problems more quickly. He noted that the weakest aspect of local-area network technology is in diagnostics and problem resolution. "Although there has been some improvement," he said, "local networks are definitely still in the adolescent stage of development.

"We have achieved some savings," he added. "But we cannot compare products feature by feature because comparable products have not existed in the company. There must be some bottom-line impact when I can get information to a trader faster."

Stouder said Continental Grain end users now depend heavily on the file server, so his biggest management concern is keeping the product working at all costs. Because the project is still considered to be developmental, there is no established system of redundancy.

"Our server has come down for a few days," he said. "Unless you have adequate backup capabilities, you're out of luck. We can always get information the old way, even though it may not be efficient.

"A company of any size can afford a spare server," he added. File servers typically cost up to $18,000, depending on the server size and specific application.

Stouder said one of the toughest aspects of adding new technology in a company is getting upper management consent. He said he believed communications managers need a high degree of credibility within their organization — obtained by the success of past projects.

"Without previous success," he said, "we would have a tough time convincing management to accept any project."

NEW PRODUCTS AND SERVICES

Coming up in the Aug. 11 issue:
- ▶Overview of portable data terminals
- ▶Comparison of Pactel's Spectrum, AT&T's Dataphone II modems

▶NETWORK CONTROL

Emcom adds to Mics software

Tool expands range of information.

BY JIM BROWN
New Products Editor

PLANO, Texas — Emcom Corp. released software that integrates data collected from its Network Control System (NCS-70) with MVS Integrated Control System (Mics) software from Vienna, Va.-based Morino Associates, Inc.

Emcom markets a data communications network performance analysis system that collects response time information and relays it to a control terminal and mainframe computer data base. Morino Associates' Mics package collects host usage and performance data from IBM mainframe systems running under the MVS operating system and generates reports about the overall host system performance.

Information about the performance of the data communications network collected by Emcom's Mics software component can be combined with host system performance data collected from other Mics components such as a time-sharing option monitor and a direct access storage device management module. The combined data enables a user to analyze complete network performance, from the host to a remote terminal, said Wallace Finney, Emcom's vice-president of sales.

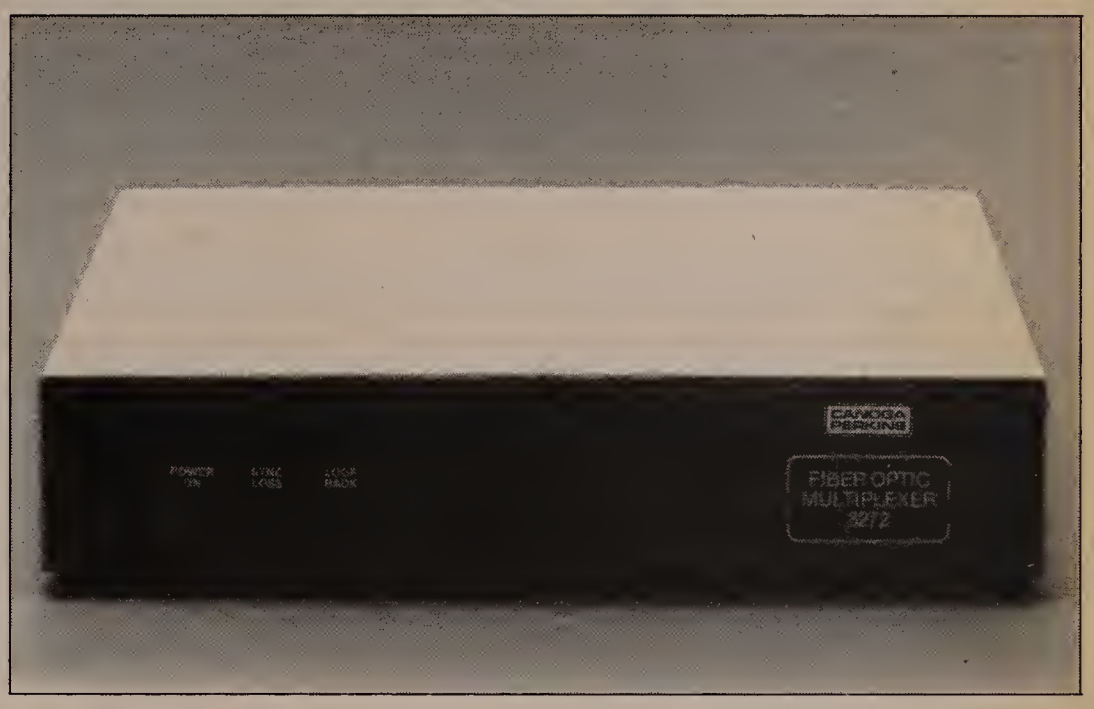
Emcom's Mics component is an outgrowth of Emcom's own data communications network performance analysis software, which created an Emcom data base on an MVS operated mainframe. Used in conjunction with SAS Institute, Inc.'s report-generating software, that data base could be used to prepare 28 different network performance and usage reports.

Emcom's NCS-70 series system is a performance measurement unit that taps into communications lines with an RS-232 T-type connector and passively monitors system communications. The unit reports in real time on such things as protocol discrepancies, response time, communications line utilization, transaction activities and application performance.

The unit also reports 250 different types of real-time alarms and error conditions that commonly afflict data communications networks, Finney said. Real-time reports are displayed on an IBM Personal Computer. The information is also sent to the mainframe data base, where reports on historical network performance can be generated.

Finney said the NCS-70 series creates a synchronized, time-stamped record of every transaction occurring on a monitored data communications circuit.

Emcom's Mics software component can be purchased from Emcom for $4,000.



▶TRANSMISSION

Canoga Perkins unveils fiber-optic multiplexer

BY JIM BROWN
New Products Editor

CANOGA PARK, Calif. — Canoga Perkins introduced a fiber-optic multiplexer that supports from 18 to 144 channels.

The full-duplex 3272 model operates synchronously or asynchronously and is being aimed at the entry-level fiber-optic multiplexer market.

Supporting transmission distances of up to 3.72 miles, a typical application would link data terminals in a point-to-point campus-type environment.

A principal product benefit stems from fiber-optic cable's immunity to the electromagnetic and radio frequency interference often found in multiple building facilities, said Les Vogel, an application engineer at Canoga Perkins. The company also claims the 3272 has a bit error rate of 1×10^{-9}.

The 3272 has a selectable channel capacity supporting a variety of transmission speeds. A fully expanded 3272 device will support 72 channels operating at 19.2K bit/sec and 72 channels operating at 2,400 bit/sec, Vogel said. In applications requiring faster operating speeds, the 3272 can be configured to support 18 channels operating at 76.8K bit/sec asynchronously with no control channels.

The number of data channels the 3272 multiplexer will support depends upon the transmission speed required and the number of control channels required, Vogel said.

Depending on the number of channels and operation speeds, pricing for a stand-alone pair of 3272 model multiplexers ranges from $4,700 to $10,700.

PRODUCTS & SERVICES

Desktop modem

Prentice Corp. recently released a 1,200 bit/sec desktop modem compatible with the Hayes Microcomputer Products, Inc. Smartmodem.

The **P212ZX** modem, which offers full-duplex, asynchronous operation over switched telephone networks, is designed for distributed applications such as electronic mail and for access to public information services such as Tymnet and Telenet.

The P212ZX is compatible with Bell 103 and 212A modems as well as Hayes Smartmodem products and Prentice's Popcom family of personal computer modems. Manual-option switches have been incorporated in the P212ZX's design to allow smart or dumb terminal operation. The device is capable of automatic voice/data switching over the same line during the same call.

The P212ZX is priced at $325.

Prentice Corp., 266 Caspian Drive, P.O. Box 3544, Sunnyvale, Calif. 94088-3544 (408) 734-9810.

Broadband data modem

Scientific-Atlanta, Inc. announced a new broadband data modem with programmable input rates and transmit and receive frequencies.

The Model 6404 employs quadrature amplitude modulation. By spacing transmit and receive channels at 750 KHz intervals, the modem reportedly achieves more than 140 full-duplex circuits on a single 450-MHz broadband cable.

The device also reportedly has programmable data input rates for V.35 and RS-449 interfaces of between 56K bit/sec and 1.544M bit/sec.

In addition, the device supports selectable transmit and receive frequencies in steps of 250 KHz, remote loop-back testing, programmable transmit level control and an Ascii serial RS-232 auxiliary communications port for remote programming, diagnostic testing and status monitoring. All programming, testing and monitoring can be accessed from the front panel through an RJ-11C connector and a hand-held modem controller, Model 6404C.

The Model 6404 ranges in price from $4,995 to $5,295, depending on interfaces.

Scientific-Atlanta, Inc., 1 Technology Pkwy., Box 105600, Atlanta, Ga. 30348 (404) 441-4000.

Opinions

MODERN MANAGEMENT

WALTER ULRICH

Why use a consultant?

The talents of communications consultants have produced successful results for companies that hire them. Yet most companies today do not use consultants.

That was just one surprising result of a study conducted by an independent polling organization retained by Walter E. Ulrich Consulting, Inc. The polling organization asked nine questions of Houston-based senior technical managers, who were selected at random from more than 50 companies. Each of those companies posted at least $250 million in annual revenue.

Respondents were asked to describe their communications consulting experience in three categories: network consulting, telephone system consulting and general telecommunications system consulting. In each consulting category, users were asked how they rated their overall experience with consulting firms.

At least 80% of the respondents in each category rated their experience as excellent or good. None rated their experience as poor.

During a five-year period, it's likely every company will have at least one occasion to call in a consultant. However, less than half of the companies surveyed had used consultants in the last five years. Of those that did, 41% used telephone systems consultants, 22% used telecommunications consultants and 20% used network consultants. The managers were asked what criteria are important when selecting outside consultants. More than half, 53%, indicated previous experience and references from past clients as critical. One-fourth looked at technical expertise closely, and 22% considered cost to be an important factor. Only 4% based their selection on the quality or detail of a consultant's proposal.

In general, companies use many different types of consultants, including lawyers, accountants, public relations agencies, marketing advisors, sales consultants, industrial engineers and communications consultants. In most organizations, though, consultants are routinely accepted and wisely used.

But communications technology is relatively new, and its complexities have come into play only since the Federal Communications Commission's Carterfone decision in 1968. Communications managers are often uncertain how to find and engage consultants, and communications consulting firms have yet to establish themselves firmly with the business public.

> *"Consultants are routinely accepted and widely used."*

As the survey shows, most consultants deliver solid results and sound recommendations. Companies that have had successful consulting experiences will be using consultants again, and communications managers who have not used consultants should be encouraged by these results to establish a relationship with a consulting firm.

The survey also indicates that technology managers understand that consultants must be evaluated based upon their past performance. Reference checking is imperative, and managers should ensure that their consultants understand business and cultural issues as well as technical issues.

Managers surveyed listed cost as a lesser concern. A company wants the best advice it can get, not the cheapest advice it can find. In fact, a more expensive consulting engagement often has a broader scope, includes better qualified consultants and gives better results. When major communications decisions are being made, quality is more important than price.

Proposals, which users often employ to evaluate and select products such as private branch exchanges, were given low weight by the respondents. Proposals are most helpful when requirements can be reduced to statistical information about the number of telephones and hundred call seconds (CCS). Proposals aren't best used to evaluate insight, expertise and experience. At Walter Ulrich Consulting, a proposal usually documents a project that has already been agreed upon.

Consultants can and do make an important contribution in the communications industry. Consultants contribute expertise, experience, independence, objectivity and concentrated focus to help client companies make better decisions more quickly. Companies that do not have experience with consultants should begin building a relationship with a consulting firm today.

Ulrich is president of Walter E. Ulrich Consulting, Inc. in Houston.

AT&T STRATEGIES

MICHAEL SCHUMER

History repeats itself

AT&T Communications, Inc. is attempting to force customers to migrate from private-line, premises-based networks to usage-priced Software Defined Networks (SDN) before less expensive transmission alternatives become available.

When users hear the words "AT&T" and "migration strategy" together, they think of AT&T's attempt in the early part of this decade to induce customers to migrate from electromechanical private branch exchanges to its then-flagship Dimension PBXs.

AT&T's quick attempt to hike the price of its Month-to-Month payment plan for electromechanical PBXs characterized the strategy. The intent was to provide an incentive for customers to switch to a newer PBX at a time when competitors did not have the manufacturing capabilities to meet the resulting demand for lower priced electromechanical PBXs.

The strategy was thwarted by the unwillingness of state regulatory commissions, which regulated AT&T's PBX prices at that time. The commissions refused to allow the steep increases AT&T requested through its operating telephone companies. Moreover, competitors such as Rolm Corp. and Northern Telecom, Inc. succeeded in capturing many of the "migrating" users.

Customers, the press, the Federal Communications Commission and state regulators reacted negatively to the migration strategy. As a result, AT&T scaled down requests for rate increases. If the strategy had succeeded, many AT&T customers would have given up their electromechanical PBXs, which were drawing little, if any, profit for AT&T, for its more modern PBXs.

Furthermore, because AT&T had the advantage of excess manufacturing capacity, the company might have captured more than 50% of the market for newer PBXs.

AT&T was unable to execute its strategy. There were delays in the introduction of the System/75 and System/85, as well as upheavals in AT&T's marketing and delivery due to the formation of a separate equipment subsidiary in 1983 and divestiture in 1984. Because of these problems, AT&T's market share for large PBXs fell to 25%.

History is repeating itself. There are clear parallels, but one difference is that the attempt to force migration is now on the services side of the business, rather than on the premises equipment side. In 1980, AT&T's PBX leadership was eroding quickly, and the marketing group saw PBXs as the key to account control.

In 1986, however, AT&T sees the network as the key to large account control. Today, the proliferation of premises-based alternatives, as well as the threats of inexpensive fiber bandwidth and existing satellite overcapacity, is attacking AT&T's networking dominance.

In the case of the PBX, AT&T began to move before competitors were able to meet demand. The same is true today because alternative fiber-based carriers are not ready to compete.

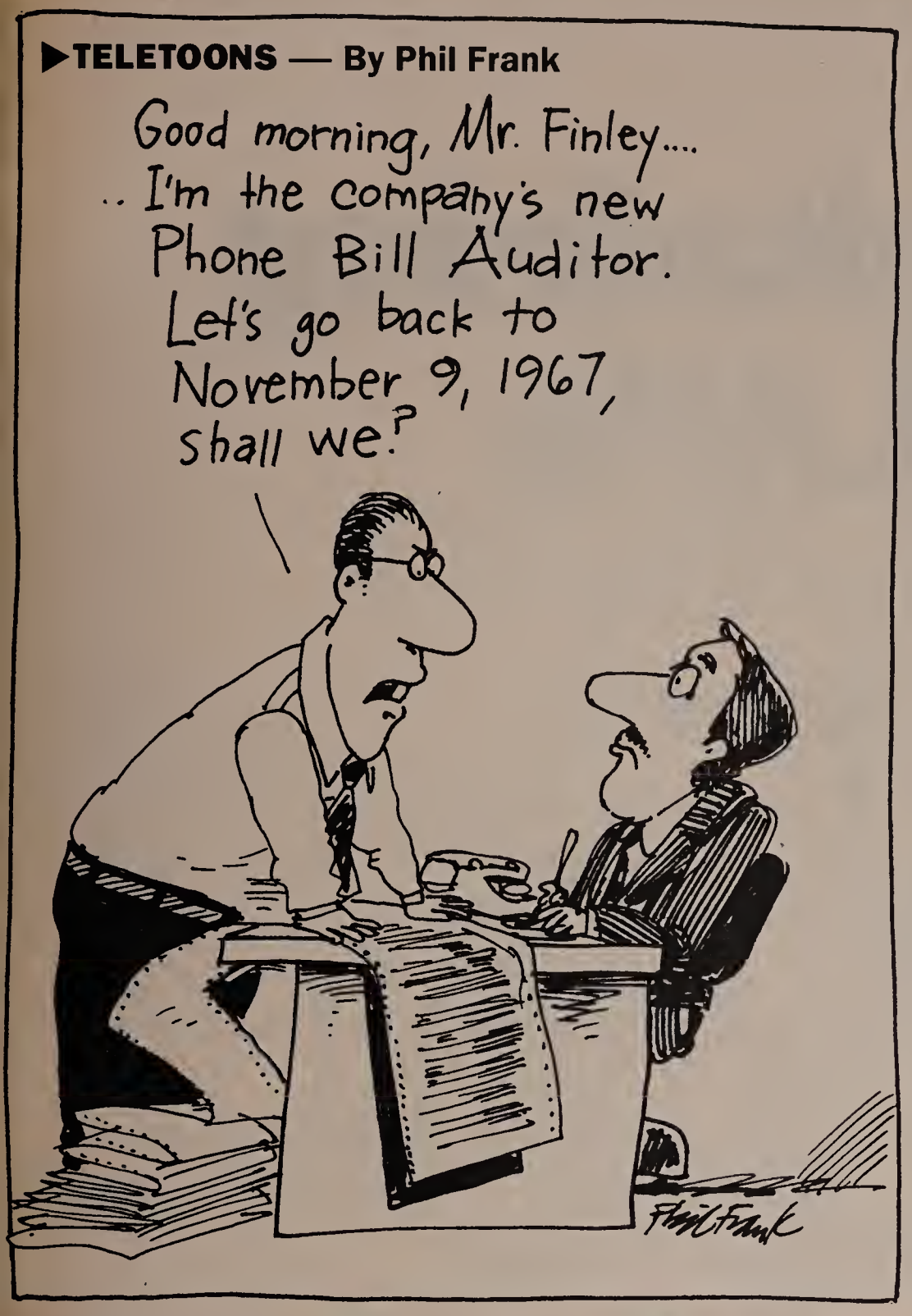
Just as AT&T raised the price of its electromechanical PBXs a few years ago to make the Dimension PBX a more cost-effective alternative, the company is now raising its private-line rates to make the SDN more attractive.

By raising the price of private, premises-based networks, AT&T is trying to force users' migration to the SDN before its competitors gain a foothold in the market. And this isn't the end of AT&T's migration strategy either. Once customers purchase equipment, they can become locked in to vendors' proprietary schemes and will be forced to continue to buy from the same vendors. A lock-in ensures that customers don't defect to the competition after the manufacturing or supply constraints disappear.

Schumer is vice-president and director of telecommunications research advisory and strategic planning services at Gartner Group, Inc. in Stamford, Conn.

Opinions

▶TELETOONS — By Phil Frank



AT&T accomplished this with its PBX by raising Month-to-Month rates to the point where customers preferred longer term leases.

With today's SDNs, lock-in is automatic. This is due to the tremendous difficulty involved in changing network architecture once a decision has been made and once the customer reduces staffing levels. Here, the analogy stops.

Although the PBX migration strategy was thwarted by state regulators, AT&T seems to be having little difficulty in obtaining approval for SDN and private-line rate hikes.

In fact, forced migration is continuing: AT&T's recent rate filing includes a 10% SDN rate decrease.

The Bell operating companies will be following similar strategies to protect their intralocal access and transport area toll businesses. For example, New York Telephone Co. just filed for an intra-Lata SDN. The fate of this filing lies in the hands of U.S. District Court Judge Harold Greene because the inclusion of automatic route selection in the service may be deemed as impinging upon Modified Final Judgment restrictions.

If Judge Greene approves the filing, the state commissions are likely to support it as well, because migrating from the BOCs adversely affects residential telephone rates.

Although SDN looks attractive to some users today, the basis of comparison, private-line networks, has been tampered with by AT&T.

Furthermore, once enough customers migrate, an alternative bandwidth market may not be created, and AT&T will probably either increase SDN prices or not decrease them as quickly as usual. The success of AT&T's migration strategy depends on the number of customers willing to yield control of their networks and to accept pure SDN designs or hybrid designs with heavy SDN content.

SDN has its place as an overflow and backup to premises-based networks that serve lower volume areas and expansion needs.

But users should be cautious about giving up control of their networks. Firms with cash-flow difficulties, such as oil companies, may use SDN to reduce their staff costs today, only to find themselves locked in and unable to return to premises-based solutions tomorrow. Clearly, users should avoid this possibility.

PURCHASING

BY IAN ANGUS

Wanted: Better PBX proposals

Question: What's the difference between a used car salesman and a private branch exchange salesman?

Answer: The used car salesman knows he's lying.

Cynical? Yes.

True? Too often.

Over the years, the Angus Telemanagement Group has analyzed thousands of written proposals for PBX systems.

And we've listened to even more oral presentations by sales representatives hoping to sell systems to our clients.

Fewer than 10% of the proposals are done well.

Most are bad; many are atrocious.

Inaccurate and sloppy work is the norm.

It looks like a conspiracy.

Somewhere, there is a school for PBX proposal writers. In that school, the instructors teach that there is no point in being clear, complete or accurate. The general theory is that selling PBXs is all luck, so sales representatives should issue as many proposals as possible, without regard for quality, and the law of averages will produce enough winners over time.

Do you think those claims are unfair? Consider the following:

Recently, a client wanted to review some PBX proposals he had obtained. He asked six major vendors to respond.

The box score?

The first one called on the due date and asked for an extension. "Our word processor broke down on the weekend," the vendor said.

When the proposal came in, five days late, it contained no pricing information and no information on maintenance or contract terms.

The second sent a proposal that seemed to have been translated from Urdu to English by someone whose native language was neither. Most of the sentences were grammatically incorrect, and spelling errors abounded.

Number three didn't bother to attend the mandatory bidders' conference, didn't survey the site, ignored major points in the specifications and provided too few trunk cards and too many data interface cards.

The fourth offender assembled an attractive, well-typed, hardbound proposal. But it didn't even come close to following the format specified for responses. Most questions were answered with either "comply" or "see documentation." There were no details, despite the fact that the request for proposal (RFP) had explicitly warned against such responses.

In several cases, the "comply" answer was given for features the proposed system could not possibly deliver.

Number five neither responded nor offered explanation.

The sixth vendor submitted a reasonably well-written proposal. It was clean, clear and followed the specified format. Its only shortcoming was its failure to provide references. "Available on request," it said. The client said the references were already requested.

One proposal out of six was nearly adequate. The rest were completely hopeless.

This is not a unique case.

Some of these problems can be mitigated by careful preparation of the RFP.

But for the most part, PBX sales representatives seem determined to prove they are incompetent and unable to manage effectively in the business world.

Sadly, one of them usually makes the sale anyway because the customer has no choice; he must eventually buy a phone system.

Managers confronted with abominable proposals either blame themselves or cross their fingers and choose the one that is the least awful.

There is a positive side to this, though. Every once in a while, there is a good proposal — one that is clear and concise and responds to all points carefully. It provides sufficient detail without overwhelming clients with excess verbiage, and it is up-front about where the proposed system meets the specifications and where it falls short.

And that is truly a wonderful experience.

It's just like banging your head against a brick wall. It feels so good when you stop.

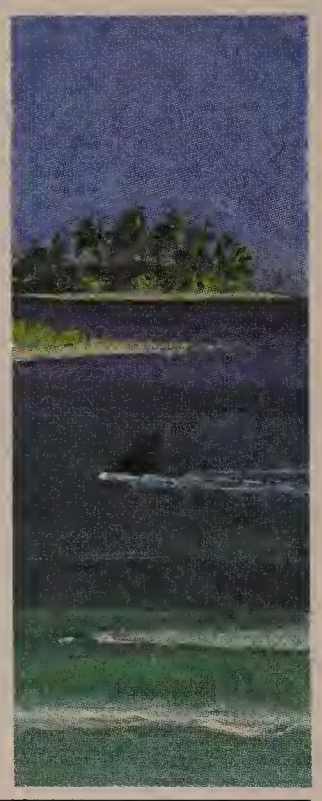
Angus is president of the Angus Telemanagement Group, Inc. in Toronto.

NETWORK WORLD

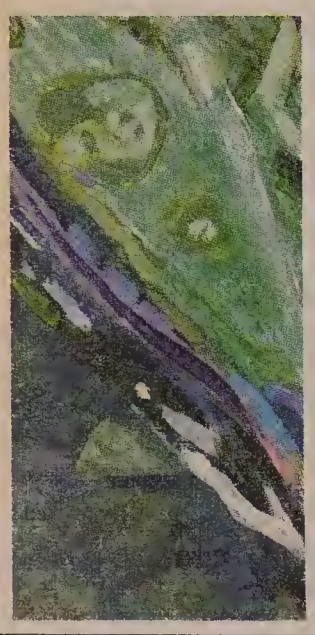
Features

August 4, 1986

Capitalizing on LANs
The banking industry is becoming less stodgy and more progressive — at least when it comes to communications solutions. Security Pacific National Bank offers an account of how it installed local-area nets to connect personal computers and communications software.
This page.



Oceans apart
Users looking forward to smooth sailing with ISDN may find themselves shipwrecked by a conglomeration of incompatible local and long-distance ISDNs, user-to-network interfaces and proprietary equipment designs from the RBOCs and others. The resulting communications calamity could transform ISDN network sites into islands of isolation.
Page one.



Banks and ISDN: The ship isn't in yet
Even though banks stand to profit handsomely by implementing "integrated financial services digital networks," they are suspicious of vendors' incompatible ISDN dabblings. Here's an in-depth look at what ISDN could do for banking.
Page 37.

▶ APPLICATION

Capitalizing on LANs

BY MARGIE SEMILOF
Senior Writer

Who says banking institutions are stodgy and slow to change? When it comes to digging up new solutions to old data processing problems, banks are often among the fiercest leaders of the pack.

The Los Angeles-based Security Pacific National Bank is a fine case in point — specifically the bank's Security Pacific Automation Co. (Spac) division, which performs data processing functions for the bank and its subsidiaries. According to Claude Lane, assistant vice-president of electronic delivery research and development at Spac, banks are beginning to take an aggressive stance in seeking customers. Technology is one vehicle that will undoubtedly provide a competitive edge.

Lane's department at Spac is currently installing identical, Novell, Inc. local-area network schemes to connect personal computers and communications software in 39 locations. The local nets are intended to help field information to more than 600 loan officers and to replace a confusing shuffle of diskette stacks among users. The local network project, which totals $4.5 million, is now in place at six of the 39 sites.

☞ Continued on **page 32**

TOM BARRETT

Spac's technical staff chose to create identical networks because they would be easier to manage from a central facility. The networks, which contain between six and 24 workstations, allow for information privacy, because some permit users to keep information in a general pool, while others split the information among teams.

The software is designed to process information received from public data bases such as Dow Jones & Company, Inc.'s Dow Jones News/Retrieval Service and Dun & Bradstreet Corp.'s Dunsnet.

"The bank's data base also contains information on various companies."

The bank's data base also contains general information on various companies, such as risk analysis and growth data, as well as specifics, such as company owners' names and titles. The material is used by loan officers within branches called Business Banking Centers (BBC) to select potential loan customers and to market banking services.

Spac also looked at other networking solutions, including a microcomputer-based IBM System 36 environment. That choice was nixed because it had no feature that would enable the bank to siphon off data for backup in the archives facility.

The local-area networks will eventually be installed in California sites from San Diego to Sacramento and will accommodate the new data base. Lane says networks in their initial implementation will operate independently of each other. However, the networks may be linked to each other and to the rest of the Security Pacific Bank network during a later phase of the project.

"The high cost of communications lines makes the linking of the networks too expensive at this time," Lane explains. "We also do not have an immediate need to share information between offices.

"The local networks will eventually be installed in sites from San Diego to Sacramento."

"The data base and the networks gave us powerful tools on their own," he adds. "When, and if, we put in host links and local net links, it will be the icing on the cake."

Omnipresent security staff

One of the primary concerns of any bank is to ensure local network security and to guard confidential data concerning prospective and existing customers.

Spac networks contain highly classified information as well as public information. Lane says the bank was not concerned about outside hackers as long as the networks remain local and there is no outside phone line or host access.

Nevertheless, security concerns created the need for two additional jobs on the bank's communications staff, a data security adviser and a data auditing adviser. The job of the advisers is to protect sensitive data. The data security adviser is also responsible for establishing information security procedures and for reviewing user networking requirements.

Both advisers work on a project from its conception through its implementation — checking system requirements and system applications and deciding what security level of data will run on the system. The security adviser is also responsible for calling in vendor support, assigning access to the local network and wiping out passwords after an employee leaves the bank.

The bank security staff also set up a system of checks and balances so that no one bank officer would be able to access the network information without the assistance of another officer.

"When we established the system, we determined that the supervisor was too powerful an individual," Lane says. "But the branch manager is the owner of the system because he must have an encompassing password.

"We have created a situation where an individual will always have to work with at least two other people to have total access to the system," he adds.

The only breach of each local-area network is an outside line and dial-in modem used for system diagnostics. The personal computer with the dial-in line and the diskette with the diagnostic program are kept in a locked room.

"It is almost impossible to seal off an environment," Lane says. "If someone wants to break into your system badly enough, he will. But you can minimize that."

Disaster recovery buddy system

Spac has set up a buddy system for its BBCs to keep each network rolling in the event of a disaster. Information is copied daily and stored in off-site archives. If a bank is physically destroyed, there are extra local-area networks in the Glendale home site that are a mirror image of each BBC site.

For short outages, each local-area network contains a battery backup power unit. The extra power allows the network operator to close files and bring the system down without crashing.

"Security concerns created the need for two additional jobs on the bank's staff, a data security adviser and a data auditing adviser."

Lane says implementing such a project is challenging, and he advises other users to consider details such as cabling requirements and the amount of power they would require for such a project. He also warns users to make sure application software will work on the local-area networks before they install the networks.

In addition, Lane advises users to establish a close working relationship with their vendors or distributors and to establish an extensive training program for network end users.

"We have one staff member on each site whose sole task is to advise network users," he says.

Spac holds all discussions of networking standards, security and strategic planning with its parent corporation, Security Pacific National Bank and Security Pacific Data Transmission Co., the division responsible for the bank's automated teller machine networks.

Lane says the bank is looking at current IBM Systems Network Architecture products for future gateway requirements that will possibly tie the local nets into other portions of the bank's network.

One department within Security Pacific National Bank is solely responsible for watching evolving technology and determining how those technologies may fit into the corporation's overall strategic plan. Lane says he was less than pleased with the functionality of available gateway and host link products.

"It is all an evolving technology," he says. "We are watching Open Systems Interconnect too. But we chose these local networks because they were here and there was a viable vendor.

"We had the need for the technology today, and the products could be purchased off the shelf and modified to each site.

"Of course, local nets are not for every application," Lane says. "But the real power in our system is that it freed our users from manipulating diskettes externally."

FEATURE FOCUS

Oceans apart

While Europe moves ahead with ISDN, a lack of coordinated policy in the U.S. may leave American users marooned.

JOHN KILROY

Continued from page 1

architecture into the U.S. are running into barriers. America's hypercompetitive policy and its fragmented communications infrastructure may leave users stranded by creating incompatible implementations of ISDN.

It is helpful to view U.S. problems with ISDN against the backdrop of the standard's worldwide growth, and especially against its development in Europe.

According to Anthony Rutkowski, a former engineering assistant at the Federal Communications Commission and member of the U.S. delegation to the CCITT, ISDN was developed through a level of international cooperation that is unprecedented in the history of telecommunications. Since 1984, ISDN has become the CCITT's dominant concern and the focal point for most CCITT working groups.

Under the CCITT's activist leadership, most national telecommunications authorities are mounting a drive to convert their existing telephony networks to the new standard. Countries as diverse as France, South Korea, Italy and Singapore have plans for ISDN implementation over the next few decades. ISDN's evolution in most of these countries will follow the CCITT's vision, in which national ISDNs evolve from the ongoing digitization of the domestic telephony network.

In most nations, the race to digitize the public network is exclusively planned and controlled by the country's Postal Telephone and Telegraph authority. The CCITT, comprising PTT representatives from more than 160 member countries, designed the I-series of ISDN recommendations in the early 1980s as guidelines for its members to follow as they pursue expensive digital upgrades.

Since then, all PTTs in CCITT European-member countries have announced plans to build national ISDNs, including switches, interfaces and compatible terminals. In each of those countries, a national ISDN plan will be followed, and a standard set of ISDN services offered at rates established nationwide by PTT administrators.

Germany's Deutsche Bundespost has already announced a portion of its ISDN tariffs — the basic monthly ISDN charge will be 54 deutsche marks, exactly twice the current monthly telephone rate. In addition, the 12 European Economic Community (EEC) members have agreed that ISDN services will be coordinated across the entire continent beginning in 1988.

A similar scenario is developing with

☞Continued on **page 36**

Belitsos is president of Lexicom, a telecommunications writing and consulting service in San Francisco.

omeday, our children will be able to share information, anywhere, anytime and in any form as easily
s we use the phone today. At Northern Telecom, we call this vision the Intelligent Universe,* and we're
ready building telecommunications products to make it a reality.

Recently, the global telecommunications industry established a set of standards called Integrated
ervices Digital Network, to help guide the future of telecommunications.

In concert with you our customer, we're fully committed to applying the principles of ISDN. After
l, these principles are but another step on the way to our vision.

I

NTEGRATED—People in different parts of the world have
fferent customs and speak different languages. That's
ecause they were relatively isolated, and their cultures
eveloped independently before the days of radio, television,
lephones and fast, easy transportation. Sometimes, it's hard
communicate.

Similarly, computers and other equipment made by dif-
rent manufacturers often find it hard to communicate, be-
ause they were developed independently and in isolation.

At Northern Telecom, we've been designing and building
lecommunications products to help change this situation.
he features and capabilities we have designed and the
esign information we make available to others let as many
fferent kinds of products as possible connect and work
gether so they work better for you. We call a network which
fers this kind of open interconnection an OPEN World.*

S

ERVICES—You don't need to understand what makes a telecommunications network tick to use it. For you, the network is just the communications services you need. And of course, the actual telephone or terminal you use is one means of accessing such services.

At Northern Telecom, we have defined and are building into the network a tremendous capability for the provision of services, and we have introduced a line of products to both access and realize this capability. We call it the Meridian† line of products. It's aimed at enhancing your communications effectiveness by offering you the services you need with the simplicity you demand. Meridian by Northern Telecom.

DIGITAL—Most people find that the best approach to solving a problem is the simplest approach. In telecommunications, the simplest way of carrying information is to convert it to a series of 1's and 0's—a digital bit stream.

A digital bit stream can mean anything—it can be your voice, a letter, a television picture, or the manufacturing diagrams for a new car.

At Northern Telecom, we've been designing and building telecommunications products based on the simple digital bit stream for two decades. We call a network that handles all information in digital form a Digital World.*

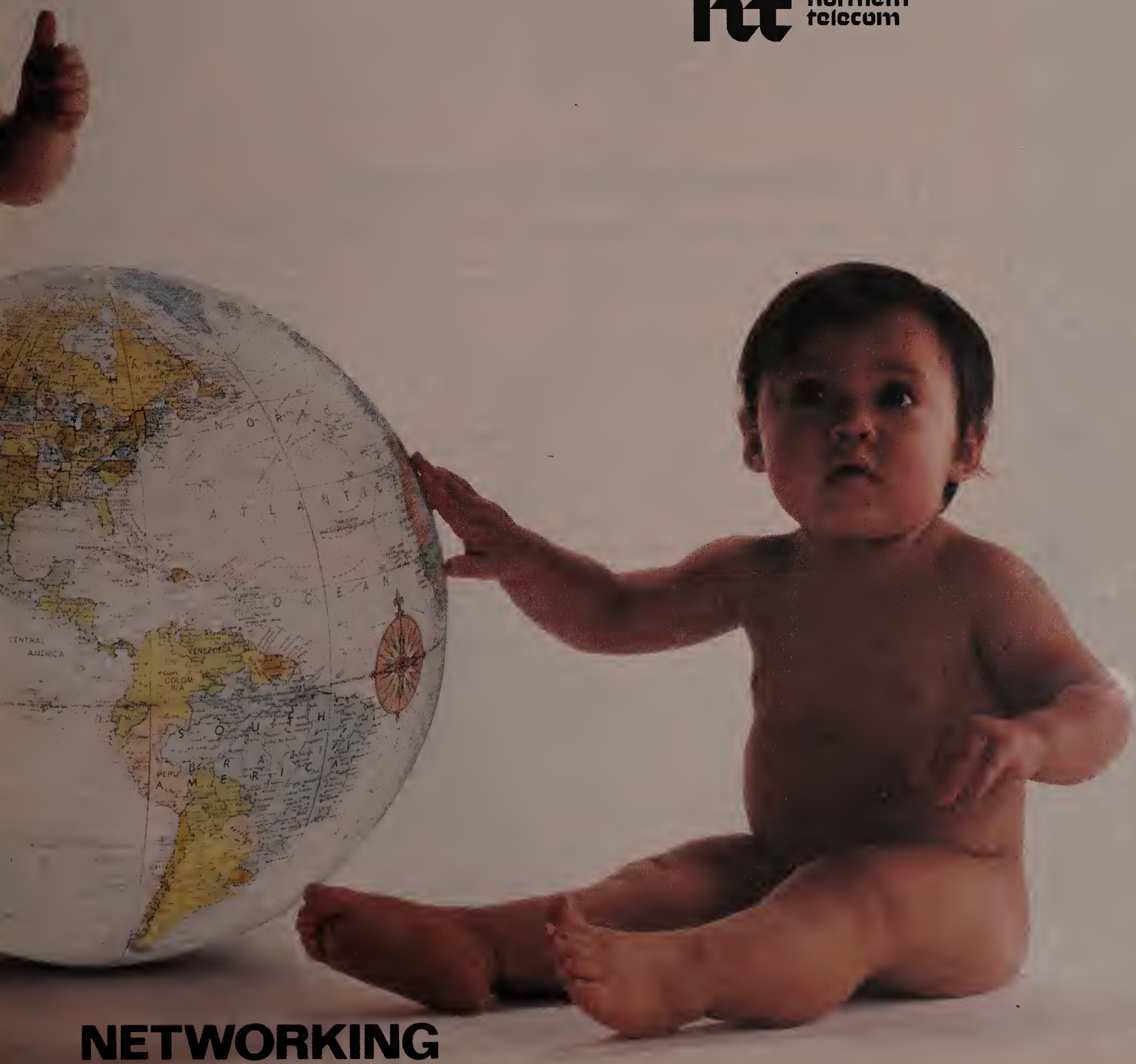
NETWORKS—In sports, a winning team starts with a good game plan, and adapts it in real time based on the changing flow of the game.

Up to now, telecommunications networks have followed a very static game plan. They were built mostly of separate elements to handle predictable changes in needs on a long-term basis. There was almost no way of controlling them in real time, so they provided little current information about overloads or breakdowns or anything.

At Northern Telecom, we have developed a new way of designing and controlling telecommunications networks. It's a game plan for public or private network architects who want to design and run their whole network like a winning team. It also lets networks carry different kinds of information more easily and economically and thereby provide the basis for supporting new services and capabilities for you.

We call it Dynamic Network Architecture.*

nt northern telecom



NETWORKING

From **page 33**

Japan's ISDN-standard Information Network Services project, which is being promoted by Japan's regulated quasi monopoly, Nippon Telephone and Telegraph Corp.

ISDN's status in the anarchic U.S. communications environment, however, does not look as favorable as it does elsewhere around the globe.

Divestiture and a variety of Federal Communications Commission regulatory actions have fragmented the U.S.'s telecommunications infrastructure in four ways.

First, the regional Bell operating companies are now autonomous entities, pursuing their own courses under intermittent regulation by the Department of Justice and the FCC.

They can elect to comply voluntarily with standards recommendations offered by such bodies as the CCITT, Exchange Carriers Standards Association T1D1 Technical Subcommittee and Bell Communications Research, Inc. (Bellcore), which is the technical research institute jointly funded by the seven BOCs. Unlike Western Europe, the activities of local telephone companies in the U.S. are not bound by a central planning authority.

Second, the intra-local access and transport area communications services provided by the BOCs are divided from inter-Lata services offered by AT&T and the other common carriers.

Third, the RBOCs may provide regulated basic services and so-called enhanced services, but must offer an open architecture allowing "comparably efficient interconnection" by private-sector providers of enhanced services.

Finally, the RBOCs can interconnect customer premises equipment but may not manufacture or control the purchase of such equipment.

U.S. policymakers have long argued that these divisions provide opportunities for innovation and competition in telecommunications markets, but this policy enormously complicates the introduction of ISDN in the U.S.

Although U.S. policy favoring competition provides many new opportunities in the market for ISDN products and services, it is having four major adverse impacts.

These include the rise of local ISDN islands, the threat of proprietary equipment designs, the "dis-integration" of long-distance ISDNs and disagreement over user-to-network interfaces.

Islands of incompatibility

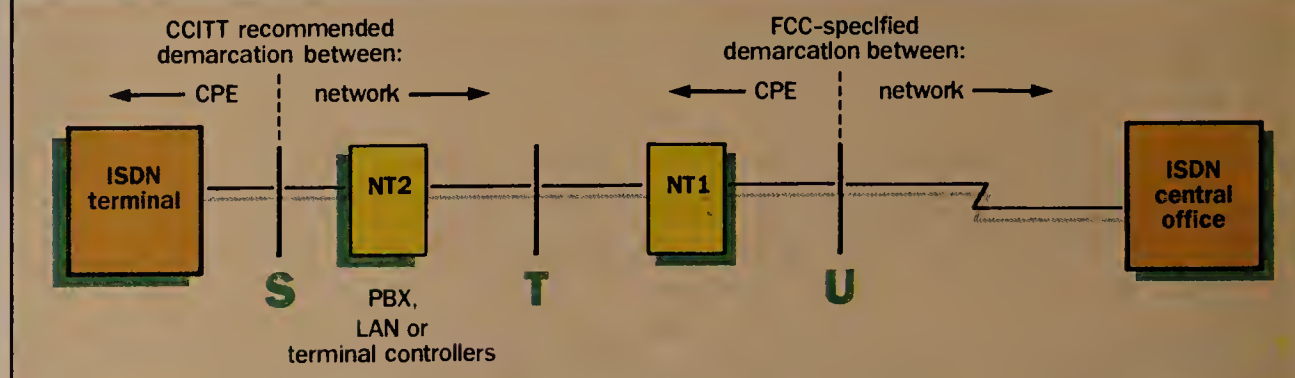
U.S. telecommunications policy is creating ISDN islands. In the U.S., ISDN will primarily be an architecture for an intra-Lata digital communications service that will evolve from local telephone networks, rather than from the centralized plans of a national administration, such as a PTT.

This scenario of ISDN islands is illustrated by the diversity of implementations in ISDN trials currently being launched by the RBOCs.

The RBOCs are under enormous pressure to develop ISDN quickly to stem the erosion of their business subscriber base by by-

Continued on **page 39**

ISDN customer-to-network interfaces: FCC vs. CCITT



The equipment between the S and U Interface includes the much-touted universal ISDN "plug," which attaches to desktop terminal equipment for ISDN basic rate access, PBXs and LANs (NT2), and specialized devices between the T and U Interface (NT1).

LAN = Local-area network
CPE = Customer premises equipment
NT = Network termination
CCITT = Consultative Committee on International Telephony and Telegraphy
FCC = Federal Communications Commission
PBX = Private Branch Exchange
ISDN = Integrated Services Digital Network

SOURCE: LEXICOM, SAN FRANCISCO

▶ STANDARDS

A contradiction in trends

Developing ISDN may mean trading off standards for innovation.

The growth of the Integrated Services Digital Network, like most advanced technologies, is being shaped by the movement toward standards and the process of technological innovation. These usually contradictory trends benefit users in different ways. Currently, the environment of deregulation under which ISDN is developing in the U.S. has raised these tensions to unprecedented levels.

The global standardization of ISDN equipment, services and interfaces has created a worldwide market for compatible products. Manufacturing for a global market allows vendors increased economies of scale, affords greater concentration on research and development and reduces the risks and costs of market entry. The result is lower costs, higher quality products and less confusion for users.

Standards also allow the Postal Telephone and Telegraphs to offer users voice and nonvoice transport at lower cost. One of the main tenets of ISDN is to exploit the existing capital-intensive telephony infrastructure to the greatest extent possible, leaving in place existing equipment, including trunks, switches and the entire subscriber loop for basic access. From here, ISDN offers users a standardized path of technological evolution. With ISDN, public network providers will no longer need to deploy specialized equipment to accommodate the wide variety of services in demand.

On the other hand, standards can sometimes hamper competition and innovation, which works to the detriment of users. The divestiture of AT&T was largely the result of this realization by U.S. policymakers. The 1968 Carterfone decision allowed a nonstandard, innovative mobile telephony product the right of access to the public network. Since then, the U.S. interconnect industry has skillfully deployed the competition and innovation argument in lobbying the government to move further and further toward deregulation.

The resulting government actions in this direction have been the most radical solution to the trade-off between standards and innovation attempted anywhere. It has created an explosion of new equipment and services that is unprecedented in the history of telecommunications.

The concept of ISDN is itself the result of a series of innovations that have allowed the progressive digitalization of the telephony network. Technological evolution must be allowed to continue uninhibited. Standardization at any level in this evolution may freeze technological progress and limit a user's selection to a predetermined set of choices. Furthermore, it can eliminate the incentives for potential competitors to create new solutions.

According to Edward I. Kay, director of marketing and sales of NEC America, Inc., "We must be wary to not let the ISDN standard retard superior technologies from taking over, should ISDN itself become stale or deficient."

Users benefit most when standards and innovation are held in a balance. Many observers think this balance was lost in the local-area network market, which may explain why the growth rate of the local-net market is dramatically below projections made a few years ago.

Ron Reubusch, director of strategic marketing for the telecommunications products division of chip maker Advanced Micro Devices, Inc., has one explanation. "In the critical phase between the initial Ethernet proposal and the time when cost-effective Ethernet-specific integrated circuits could hit the market, a plethora of competing standards were created. In the absence of a genuine standard, semiconductor makers weren't able to attain high-volume integrated circuit production. End users became confused and postponed purchasing decisions. The problem has been the IEEE 802 committee's decision-making process. There is no referee except other competing members of the local-area network industry sitting on the 802 committee."

The triumph of X.400 demonstrates a healthier balance between innovation and standards. Proprietary electronic-mail systems proliferated for a time against the backdrop of the international telex standard. Aggressive start-up companies freely exploited the new market. Unlike ISDN, messaging technology was well developed, and the need for standards was well understood before the creation of a standard. Then, unlike the local net situation, the creation of a standard was turned over to an objective body, the Consultative Committee on International Telephony and Telegraphy.

But what is most remarkable about X.400 is its implementation. Unlike X.25 and ISDN, X.400 has not encouraged a wide latitude of interpretation. With the guidance of the Corporation for Open Systems and other organizations, a complete set of product specifications is being written, and standards organizations are developing testing and certification facilities to ensure compatibility. One can only hope that someday the same wisdom will penetrate the domain of ISDN, where the challenge is far more complex and the stakes far higher.

— Byron Belitsos

NETWORK WORLD

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1 **My primary areas of activity.** Circle ONE only.
I am involved in evaluating communications (data, voice and /or image) products and services:
1. for *use within my own* company/organization
2. for *resale* to other companies/organizations
3. Both

1a **For communications, my primary responsibility is:** Circle ONE only.
1. Data Communications
2. Voice Communications
3. Both

2 **Circle only the ONE title classification which most applies to you.**

Company Management
11. Chairman, Pres., Owner, Gen. Mgr., Partner, Director, CIO, VP, Dir. Head of Finance, Admin. Procurement

Communications Management
Data Communications
21. Management
VP, Dir., Mgr., Head, Chief: Data Communications, including Networks, Engineering, Design, R&D, Application Development
22. Supervisory/Staff
Supervisor, Head : Networking, Design, Analysis, Engineering, R&D, Applications, Services
Telecommunications
31. Management
VP, Dir., Mgr., Head, Chief: Telecomm., Voice Comm., including Networks. Engineering, Design, R&D, Application Development
32. Supervisory/Staff
Supervisor, Head: Networks, Design, Analysis, Engineering, R&D, Applications Services
Factory Communications
41. Management
42. Supervisory/Staff

MIS/Data Processing
51. Management
VP, Dir., Mgr., Head, Chief: MIS/DP, Systems Application Development, Operations, Office Automation
52. Supervisory/Staff: Supervisor, Head of System Design, Analysis, Applications

Others
75. Consultant
80. Educator
85. Financial Analyst
90. Marketing/Sales
95. Other _____

3 **Job Function**
Which one of the following best describes your functional involvement with communications (data, voice, and/or video) products? Circle ONE only.

Corporate
1. Business Management, Planning and/or Development

Communications System/Network
2. Management, Planning and/or Development
3. Implementation and/or Operation
4. Other _____

4 **Which one of the following best describes the primary business activity of your organization at this location?** Circle ONE only.

Consultants
11. DP/Communications Consulting Services
12. Consulting Services (except DP/Communications)

End Users
13. Manufacturer (other than computer/communications)
22. Finance/Banking/Insurance/Real Estate
23. Education
24. Medicine/Law
25. Wholesale/Retail Trade
26. Public Utility/Transportation
27. Mining/Construction/Petroleum Refining/ Agriculture/Forestry
28. Business Services (excluding DP/Communications)
29. Government: Federal
30. Government: State/Local

Vendors
41. Carrier: including AT&T, BOCs, Independent Telcos, Public Data Networks, Intern'l Records Carriers
42. Interconnect
43. Manufacturer Computer/Communications Equipment
44. Value Added Reseller (VAR), Systems House, Systems Integrator
45. Distributor
46. DP/Communications Services (excluding consulting)
95. Other _____

5 **In which ways do you typically become involved in acquiring communications products (data, voice, and/or video) and services?** Circle ALL that apply.
1. Recommend/Specify
2. Identify/Evaluate Potential Vendors
3. Approve the Acquisition
4. None of the Above

6 **Check ALL that apply in columns A and B.**
A. I am personally involved in the acquisition process (specification, selection, approval) for the following products and services:
B. These products and services are presently in use at this location:

A	B	*Product/Services*
		Computers
☐	☐	01. Micros
☐	☐	02. Minis
☐	☐	03. Mainframes
		Data Communications
☐	☐	04. Communications Processors
☐	☐	05. Comm./Networks Software
☐	☐	06. Digital Switching Equipment
☐	☐	07. Facsimile
☐	☐	08. Modems
☐	☐	09. Multiplexers
☐	☐	10. Protocol Converters
☐	☐	11. Network Mgmt. & Control
☐	☐	12. Test Equipment
☐	☐	13. 3270 Controllers
		Telecommunications
☐	☐	14. PBXs
☐	☐	15. Key Systems
☐	☐	16. Central Office Equipment
☐	☐	17. Integrated Voice/Data Terminals

A	B	*Product/Services*
		Transmission/Network Services Equipment
☐	☐	18. Microwave
☐	☐	19. Satellite Earth Stations
☐	☐	20. Local Area Networks
☐	☐	21. Wide Area Networks
☐	☐	22. Packet Switching Equipment
☐	☐	23. Fiber Optic Equipment
		Communications Services
☐	☐	24. Packet Switching Services
☐	☐	25. Cellular Mobile Radio Services
☐	☐	26. Electronic Mail
☐	☐	27. Enhanced Services
☐	☐	28. Centrex

7 **Estimated value of communications systems, equipment and services:**
A. which you helped specify, recommend or approve in *last* 12 months? Check only ONE in column A.
B. which you plan to specify, recommend or approve in *next* 12 months? Check only ONE in column B.

A	B		A	B	
☐	☐	1. Over 10 million	☐	☐	6. $100,000-250,000
☐	☐	2. $5-10 million	☐	☐	7. $50,000-100,000
☐	☐	3. $1-5 million	☐	☐	8. Under 50,000
☐	☐	4. $500,000-1 million	☐	☐	9. Don't know
☐	☐	5. $250,000-500,000			

8 **Estimated gross annual revenues for your entire company/institution:**
Circle only ONE.
1. Over $1 billion
2. $100 million to $1 billion
3. $5 million to $100 million
4. Under $5 million

9 **Estimated number of total employees at this location:**
Circle only ONE.
1. Over 5,000
2. 1,000-4,999
3. 500-999
4. 250-499
5. 100-249
6. 50-99
7. 20-49
8. 1-19

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SPECIAL SECTION: ISDN

Banks and ISDN: The ship isn't in yet

JOHN KILROY

BY MARC H. RUDOV
Special to Network World

Probably no market could more readily apply the benefits of Integrated Services Digital Network architecture than the financial services industry.

The reason is simple: Electronic delivery of financial services is largely a transaction-based endeavor characterized by intermittent bursts of information; yet for the most part it is accomplished inefficiently, albeit reliably, via leased analog lines.

ISDNs, as envisioned by the Consultative Committee on International Telephony and Telegraphy, a standards body, will enable subscribers to choose both the rates and switching methods — packet or circuit — for exchanging information digitally, through universally standardized hookups.

In delivering to customers a wide range of financial services, from electronic funds transfers to automated information retrieval, network operators could benefit greatly from these ISDN features, which would allow them to configure their networks to match the particular transmission requirements of a given financial service. In effect, they would be operating integrated financial services digital networks.

Unfortunately, the U.S.-based purveyors of ISDN trials and customer premises equipment are concentrating more on beating each other to the market with differing variations of ISDN standards, rather than first reaching a consensus on standards and then competing to resolve customers' problems with the highest efficiency or the best price. ISDNs are not the most elegant solution to the communications equipment connectivity problem — but elegance is not what is needed in this industry: standardization is. Without endorsed and practiced uniformity, however, vendors will turn the ISDN evolution into just another attempt to bombard users with digital technology.

Electronic delivery systems

Electronic delivery of financial services comprises mainly telefunds and telepublishing. Telefunds delivery is the paperless, electronic transfer of money from bank account to bank account between banks, corporations, governments, retail establishments and consumers.

Telepublishing is the electronic dissemination of financial information — securities quotations and trades, money market and currency rates, corporate accounting reports and so on — from a data base provider to a bevy of subscribers. The markets for both telefunds and telepublishing services are divided into two segments: retail and wholesale. The retail segment is defined by any involvement of consumers in financial transactions, whether

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Rudov is president of Telematics Resource Group in Wellesley, Mass.

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through automated teller machines (ATMs), point-of-sale (POS) terminals, home-banking and information systems or direct payroll deposits. Conversely, the wholesale segment excludes consumers and encompasses all business and government entities.

The wholesale telefunds market is characterized by rapid migration toward digital network technology. In the U.S., the key telefunds-network provider is the Federal Reserve Communications System, through its nationwide packet-switched network, Fedwire.

Each of the 12 Federal Reserve Banks is a node in Fedwire, linked to the next node by a 56K bit/sec line leased from AT&T. Within a district, however, banks transmit to the packet node through a variety of asynchronous and synchronous methods that first require protocol conversion. Fully implemented ISDNs could eliminate the need for such conversions.

International funds transfers are established via the Society for Worldwide Interbank Financial Telecommunications (Swift) network, which is now undergoing an upgrade from a message-based network to an Open Systems Interconnect-based packet-switched network.

No funds are actually transferred via Swift, just the instructions to effect the transfers. Typically, U.S. banks electronically exchange funds with Manhattan-based branches of foreign banks through the Clearing House Interbank Payments System (Chips) network, operated by the New York Clearing House Association.

> *"Competitive advantage has always played a more important role in determining the actions of banks than has customer needs."*

Connections to the Chips computer system currently are made via 4.8K bit/sec, point-to-point analog lines, although a migration to 9.6K bit/sec and 14.4K bit/sec analog lines is planned.

Because the Federal Reserve Board recently reduced the limits that banks may reach on daylight overdrafts — the situation when a bank, within the working day, wires out more money than it receives — most banks must now wait until the end of the day to effect transfers, when they have the funds to cover them. This causes a peak demand for bandwidth and processing power.

It is wasteful to lease high-bandwidth lines just to accommodate the peak demand at 4 p.m. But, without dynamic bandwidth allocation, such as that planned for ISDNs, there is no alternative.

In the retail-telefunds environment, networks that link ATMs and POS/direct-debit terminals consist primarily of leased, analog, point-to-point 2,400, 4.8K and 9.6K bit/sec lines. On a local basis, ATMs are connected to their transaction processors quite satisfactorily through 2,400 bit/sec analog lines. Only those ATMs dually connected in regional or national shared-ATM networks use the higher speeds.

No ATM-network operators surveyed by the Telematics Resource Group plan to drop analog technology anytime soon, as it is proven and reliable.

In the U.S., there is strong reluctance among competitors in the telecommunications industry to collaborate on standards, especially ISDN standards; a similar environment prevails in the banking industry. Perceived competitive advantage has always played a more important role in determining the actions of banks than has customer needs.

Originally, it was a strategic advantage for a bank to operate a local, proprietary ATM network: Customers gravitated to the bank that made it the most convenient to withdraw cash. What evolved were hundreds of distinctly different ATM networks across the country, each with its own set of switching protocols.

Now, customers favor the banks that can extend their territories the farthest through shared-ATM networks, such as Cirrus and Plus. Hence, the regionalized markets are forcing unrelated banks to collaborate on a national scale. Typically, these separate ATM networks are interlinked via 9.6K bit/sec leased analog lines, and the trend is to continue to exploit the upper limits of analog technology before exploring digital technology.

Only a minority of merchants are now equipped to offer POS/direct-debit services, which facilitate retail transactions at checkout lanes. Such services permit simultaneous electronic debiting of the customer's account and crediting of the merchant's account for the amount of the purchase.

In the POS/direct-debit environment, in contrast to the ATM environment, cooperation is mandatory among banks and merchants: One debit card must work in every store and be supported by all banks. Yet, because banks historically have not been eager to collaborate, there are only a few successful POS projects in this country.

In Iowa, for example, sharing was mandated by the state legislature, to the benefit, it turns out, of all.

Network stability

Another critical element of successful POS networks is stability, specifically response time and uptime. Retail customers will not tolerate an automated checkout procedure that is less efficient than a manual one. Therefore, experimenting with new network technologies may be a risk that bankers and merchants don't want to take.

On the other hand, with network operators complaining about the 150% and 200% hikes in local-line charges, one would expect them to be clamoring for network features such as those proposed for ISDN services. In fact, the majority of network operators surveyed by Telematics Resource Group admitted either not knowing or not caring much about ISDNs.

Whether or not merchants offer POS/direct-debit capability, they still need to access credit- and check-authorization and credit-processing services, which is accomplished either on a dial-up or leased-line basis, depending on the merchant's volume. These processes are low-speed transactions well-suited for the packet-switching features of ISDNs.

> *"Because the consequences of a faulty data transmission aren't nearly as grave, there is more willingness to experiment with alternative technologies, especially those that reduce dependency on the increasingly expensive telephone network."*

In the world of telepublishing, the standard distribution conduit is the leased analog line, operating at 9.6K bit/sec, the speed at which trading and quotation information currently is available from the major exchanges.

In telepublishing, the stakes involved in data transmission are much lower than in telefunds delivery. Because the consequences of a faulty data transmission aren't nearly as grave, there is more willingness to experiment with alternative technologies, especially those that reduce dependency on the increasingly expensive telephone network.

Notwithstanding that the telephone network, because of its ubiquity, is the preferred method for disseminating financial information, telepublishers are currently using new media to reach their customers.

Examples of new techniques used in data broadcasting include very small aperture terminal (micro-sized satellite dish) networks, FM radio subcarriers and the vertical-blanking intervals of television broadcasting.

These media are not expected to put much of a dent in telephone network traffic, but their use demonstrates a willingness to reduce costs, and ISDN purveyors must understand this if they expect to attract customers.

Through the trade press, industry seminars and other channels, the user community is being encouraged to take an active, participatory role in ISDN standards-making and regulatory proceedings.

Typically, this strategic responsibility is fulfilled by vendors, which have both the money and special interests to warrant their participation. In the face of inconsistent ISDN product and service offerings by vendors — notwithstanding those same vendors' collective involvement in the aforementioned processes — it is no wonder that users do not flock to cooperate with vendors in matters of ISDN policy.

This nebulous environment creates significant uncertainty among users about their specific function in the ISDN evolution. How active should they be, and what should they do?

Putting the vendors to work

Users should act no differently in this situation than they would in any other purchasing role: They should make the vendors do all the work. If vendors truly are interested in users' participation in ISDN standards-making and policy-formulation, let the vendors underwrite these activities.

Also, if vendors aren't smart enough to research the needs and problems of users before beginning product development, let it be their loss if they guess incorrectly. Users, for the most part, are all too willing to participate in vendor-sponsored market research, because they benefit directly when the consequent products are introduced. This is not to suggest that users should avoid staying abreast of ISDN developments, but the limits of involvement should not be greater, as a practical matter, than for any other products or services they consume.

It is quite obvious that ISDN is desirable in the financial-services industry. But unless vendors close the books on ISDN standards and direct their attention to applications, there will be no integrated financial services digital networks. Users should boycott the "ISDN Games" until the contestants and judges agree on the ground rules. Only then will each participant's ability to excel become evident. When that happens, the stands will be filled with ready customers.

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pass vendors. However, there is nothing to prevent differing interpretations of the CCITT recommendations among the RBOCs. To its credit, Bellcore is attempting to coordinate the current ISDN field trials.

This summer's Technical Requirements Industry Forum will result in a detailed technical reference document. But according to a Bellcore spokesman, one can only hope that such documents will make ISDN fly. Meanwhile, many observers are pessimistic about ISDN's long-term prospects.

"The ISDN trials and the Bells' shortsighted approach to marketing ISDN are virtual proof that the RBOCs will be unable to build a nationwide ISDN," warns Marc H. Rudov, president of the Telematics Resource Group, a marketing consulting firm in Wellesley, Mass. "The likely long-term result will be a plethora of divergent, inconsistent and counterproductive offerings."

Proprietary equipment threat

Another adverse effect is the threat of proprietary ISDN equipment designs.

The absence of an industrywide consensus on a number of unresolved standards issues, combined with the market push for some form of ISDN implementation, is resulting in efforts by the RBOCs to write de facto ISDN standards.

According to Rudov, "The RBOCs are pressuring the switch vendors to design ISDN equipment now, before agreeing upon a nationwide standard. Given that ISDN standards are either incomplete or too flexible, vendors have little choice but to develop prototypes based on their proprietary designs."

In the short run, this will almost certainly lead to an inability to interconnect the customer premises equipment of one manufacturer to the central office gear of another.

Customers would be restricted to buying ISDN customer premises equipment from the vendor that supplies the local telephone company with ISDN central-office equipment. Several switch manufacturers are already committed to proprietary switch designs — the ISDN switches offered by AT&T and Northern Telecom, Inc. are known to be incompatible.

Long-distance dis-integration

The third impact of U.S. policy is the "dis-integration" of long-distance ISDNs. European countries, with internally unified national networks, do not face the challenge of offering equal access to local exchanges by a competing group of interexchange carriers.

In the U.S., long-distance ISDNs must be built separately from intra-Lata ISDNs; in other words, the ISDNs supplied by the BOCs must be distinct from those supplied by interexchange carriers such as AT&T and the other common carriers, value-added network vendors and other private network vendors.

For business reasons, not all companies will follow ISDN standards, and those that do will likely use only a few of the standard interfaces and services. However, the RBOCs will build intra-Lata ISDNs that include the full range of ISDN interfaces and transport services.

In the U.S. environment, nothing can guarantee that the set of services offered by an RBOC's ISDN will be simultaneously offered by a long-distance carrier. Also, each of the seven RBOCs are sure to offer different service packages or their own. This will create havoc for any company trying to link ISDN services across multiple sites nationwide. The services issue is complicated in other ways too. In the U.S., ISDN service offerings will be more fragmented than those provided in other countries because of the FCC's distinction between basic and enhanced services in the Second Computer Inquiry.

> *"Several manufacturers are already committed to proprietary designs."*

With the advent of the Third Computer Inquiry, the BOCs can offer regulated enhanced services, but must also offer comparable interconnection facilities to private-sector service providers. As a result, users will be faced with a highly complicated service environment.

Not only will there be a diversity of ISDN service packages offered by RBOCs over the their networks, but there will also be a plethora of privately offered services, varying by region, that run over the same BOC network facilities.

By contrast, European PTTs have announced telematic services such as videotex, teletex, data base access and other advanced services as a uniform package within their networks.

American policymakers argue that a competitive environment for ISDN services will bring users the benefits of price competition and more service options. However, these benefits will be offset by the difficulties in providing facilities for interconnection and in coordinating the diverse array of ISDN service options within regions and across national boundaries.

Meanwhile, users have been kept almost completely in the dark about which services to expect.

ISDN is languishing

According to Victor Krueger, vice-president of Dataquest's Telecommunications Industry Service, "The concept of ISDN is languishing in the U.S. because of the inability of potential ISDN vendors to determine standard offerings on a nationwide basis and to explain the nature and benefit of these services to users."

The final adverse consequence of current U.S. policy concerns the user-to-network interface. Because of the U.S.'s policy of competition, U.S. standards may differ from those of Europe on the most important part of ISDN — the customer-to-network interface. In the U.S., the FCC has declared the U reference point, as defined by the CCITT, to a be a customer premises interface, which is unregulated. On the other hand, the CCITT, followed by most European PTTs, has recommended drawing the line between the customer and the network at the S interface (see diagram, page 36).

All equipment on the network side of the S interface will be specified by the public network provider, while in the U.S. such equipment can be offered by nonregulated vendors. Though this attempt to bring competition into local-loop ISDN technology may encourage innovation, most users will find that it introduces an unwanted variable into a situation that is already intolerably complex. Happily, the FCC recently introduced a proposal that would allow BOC provision of desktop customer interfaces as an option for customers. A decision on the proposal is forthcoming in Computer III.

After the FCC determined the boundary between users and networks in its Network Channel Terminal Equipment ruling of 1983, Bellcore made a prophetic statement in its war of rhetoric with the independent manufacturers, who were pushing to open up this domain to competitive chaos.

> *"As a result, users will be faced with highly complicated service."*

They declared that the FCC decision would "violate the preliminary international understandings already reached in the CCITT on ISDN network interfaces. Unless carriers are allowed to provide stable, well-specified interfaces without reaching into the domain of the user, the very concept of ISDN is in jeopardy." Actually, the ideal of a universal ISDN in the U.S. is in double jeopardy. The public network is increasingly fragmented and deregulated, and the U.S. lacks a central authority to coordinate the ongoing standards work by the several existing U.S. standards bodies involved with ISDN.

Europe has not been immune to such problems. The division of the continent into 12 inward-looking PTTs has raised a coordination problem similar to that of the seven U.S. RBOCs. For example, a 1985 report by the European Commission's Information Technology Task Force complained about the lack of attention being given to cooperation between European nations in internetworking their national ISDNs.

It also warned of the possibility of national variations in the S interface and in the types of services being offered in each country.

But threats to the creation of a continental ISDN will likely be quelled by the strong arm of the European Commission. It has just completed a document requiring all 12 EEC members to agree to ISDN standards and get an ISDN service operational by 1988.

The U.S.'s deregulated environment will surely allow greater competition and innovation than is possible in Europe, but the U.S. may fall behind if the many ad hoc U.S. standards groups are unable to unify. There is currently no suitable substitute that can carry out the centralizing function provided by a PTT or the European Commission.

In the contest between competition and standards, the U.S. may be making ideological points about the wonders of free competition in stimulating the business of an interconnect industry, but the losers may well be those for whom ISDNs are provided.

Pushing the vendors

No one should be surprised if users question the ability of U.S. network providers to build a nationwide ISDN. But despite the gloomy outlook, users will have to live with whatever form of ISDN is dealt them. The alternatives to ISDN — which entail some extension of today's chaos of expensive and incompatible equipment and service options — are clearly unacceptable.

"The ISDN scenario offers far better user benefits than any possible alternative," says Dataquest's Krueger. Assuming Krueger is right, users must live with the inevitable transition difficulties. Steps that can ameliorate users' fear and loathing of ISDN include:

- Adopting an international perspective and becoming aware of the massive technological evolution toward a global ISDN that the CCITT has promoted on a world scale.
- Understanding the regulatory process. Users should learn about the trade-offs between government regulation and competition, as these factors differentially affect ISDN progress in the U.S. and other countries.
- Comparing U.S. ISDN progress to that of Europe. Users should follow the differences in the way the two continents treat key ISDN issues such as interfaces, protocols and services.
- Getting involved. Users should find ways to tell equipment and service vendors, carriers, standards committees and government officials that they will not tolerate the ISDN chaos being foisted upon them by self-serving industry groups — the same groups that once worked as a unified body to provide users with universal end-to-end telecommunications services.

Calendar

Aug. 4-5, Kansas City, Mo. — Networking the IBM PC or Compatibles. Also, Aug. 11-12, Minneapolis. Contact: The American Institute, Carnegie Building, 55 Main St., Madison, N.J. 07940.

Aug. 4-6, New York — Telecommunications Management. Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

Aug. 4-6 and Aug. 7-8, Santa Cruz, Calif. — Images: Technologies, Applications, Processing and Systems. Contact: The Institute in Computer Science, University of California Extension, Santa Cruz, Calif. 90564.

Aug. 4-6, New York — Telecommunications Management. Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

Aug. 5-6, Chicago — IBM's DBMS & 4GL. Contact: Digital Consulting Associates, Inc., 6 Windsor St., Andover, Mass. 01810.

Aug. 5-8, New York — Data Communications: Components, Systems and Networks. Also, Aug. 19-22, Anaheim, Calif. Contact: Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

Aug. 6-7, Chicago — Fiber Optics in Plain English. Contact: Clifford, Inc., 83 Main St., Bethel, Vt. 05032.

Aug. 6-8, Anchorage, Alaska — Data Communications: Fundamentals and Beyond. Also, Aug. 13-15, Boston; Aug. 20-22, Indianapolis. Contact: The American Institute, Carnegie Building, 55 Main St., Madison, N.J. 07940.

Aug. 6-8, New York — Fiber-Optic Communications. Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

Aug. 6-8, Scottsdale, Ariz. — Data Communications. Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

Aug. 9-10, Los Angeles — Softeach: The Computer Products Training Forum. Also, Aug. 23-24, Atlanta. Contact: Softsel Computer Products, Inc., 546 North Oak St., P.O. Box 6080, Inglewood, Calif. 90312-6080.

Aug. 11-12, Boston — Data Communications and Networking for the IBM PC XT/AT and Other Compatibles. Also, Aug. 18-19, Chicago; Aug. 27-28, Washington, D.C. Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810.

Aug. 11-12, New York — Fundamentals of Data Processing for Administrative Assistants and Secretaries. Contact: New York University School of Continuing Education, Seminar Center, 575 Madison Ave., New York, N.Y. 10022.

Aug. 11-13, Washington, D.C. — Controlling Corporate Network Costs. Contact: Telestrategies, 1355 Beverly Road, McLean, Va. 22101.

Aug. 11-15, Philadelphia — CICS/VS Advanced Programming/Design. Contact: Computer Assistance, Inc., Suite 480, 1150 1st Ave., Valley Forge Plaza, King of Prussia, Pa. 19406.

Aug. 13-15, Boston — SNA Architecture and Implementation Seminar. Contact: Communications Solutions, Inc., 992 S. Saratoga-Sunnyvale Road, San Jose, Calif. 95129.

Aug. 13-15, Somerset, N.J. — Internetworking and Advanced Protocols. Contact: Center for Advanced Professional Education, 1920 E. Garry St., Suite 110, Santa Ana, Calif. 92705.

Aug. 14, Minneapolis — The IBM PC Data Communications Survival Course. Also, Aug. 19, Chicago; Aug. 20, Rochester, N.Y.; Aug. 21, Boston; Aug. 28, Dallas. Contact: Data-Tech Institute, Lakeview Plaza, P.O. Box 2429, Clifton, N.J. 07015.

Aug. 18-20, Boston — Data Networks: Management, Operation and Control. Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

Aug. 18-20, Chicago — Planning an EDP Disaster Recovery Program. Contact: Computer Security Institute, Dept. ERC, 360 Church St., Northborough, Mass. 01532.

Aug. 18-22, Washington, D.C. — Radio Wave Propagation for Communications System Design. Contact: The George Washington University School of Applied Science, Washington, D.C. 20052.

Aug. 19, Plymouth, Mass. — Achieving Excellence: How to Implement the New Excellence-Oriented Management Style in Your Department or Company. Contact: CareerTrack Seminars, 1800 38th St., Boulder, Colo. 80301.

Aug. 20-21, Osterville, Mass. — Introduction to Fiber-Optic Communications Systems. Contact: Hinckley Communications, 14 Parker Road, Osterville, Mass. 02655.

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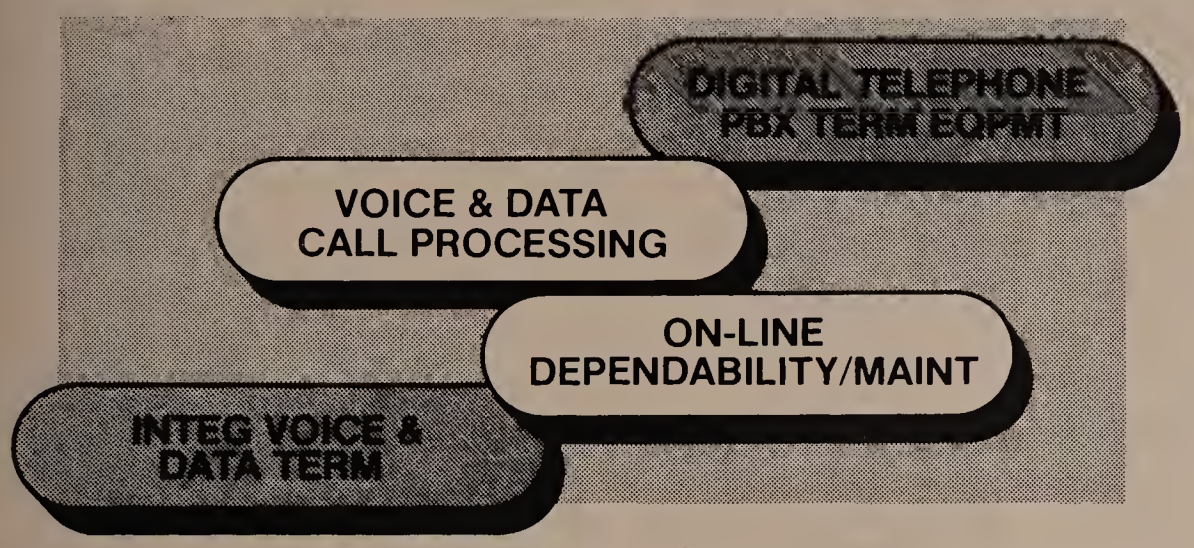

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▶ LAN MANAGEMENT

Early users ambivalent over Excelan Lanalyzer

BY MARY PETROSKY
West Coast Correspondent

Early users of an Ethernet network analysis tool introduced by Excelan, Inc. earlier this year say the device is useful but limiting because it requires users to interpret the data it presents.

Users agreed that part of the appeal of the Lanalyzer EX 5000E is that it is one of the least expensive local network monitoring tools on the market today. However, the market for local-area network management tools is far from mature.

The ITT Advanced Technology Center in Shelton, Conn., and Bedford, Mass.-based Spartacus, Inc. both originally bought the $9,500 Lanalyzer kit to help in the development of network products. Both companies subsequently put the device to work monitoring their own in-house networks. Eaton Information Management Systems Division has also evaluated the product but has not yet committed to its use.

The Lanalyzer consists of a plug-in board for IBM Personal Computer XTs, Personal Computer ATs or compatibles and software. It can be used to debug network applications and protocols, as well as to monitor network activity and troubleshoot problems.

For example, the Lanalyzer allows network administrators to capture and examine packets according to predefined parameters, such as source or destination information. Test results are displayed in real time and can also be saved for later analysis.

> *"Users agreed that part of the appeal of the Lanalyzer EX 5000E is that it is one of the least expensive local network monitoring tools on the market today."*

"It's a low-level tool, so you can use it on any 802.3, Ethernet-type network," said Howard Kilman, assistant technical manager of software development at the ITT Advanced Technology Center. "It's sort of like a logic analyzer; it gives you the raw information. For the average user, it's a very complicated device. It takes someone who understands low-level protocols to interpret it."

Kilman added, however, that the product is "invaluable for large networks. There's really not much out there at a similar cost."

The ITT Center currently has a 100-node Ethernet network. Prior to purchasing the Lanalyzer, isolating a problem on the network was a hit-or-miss proposition, where pieces of the network were removed and tested. Now, all troubleshooting can be done from a remote laboratory.

The ITT Center uses the Lanalyzer mostly to monitor network traffic and keep track of utilization levels, said Fred Schoen, a senior member of the technical staff who works with the device. Schoen is also using the tool to debug a file transfer program operating between a communications server on the network and a host computer.

Althought Lanalyzer tests are easy enough to run, they may be tricky to set up, according to Schoen and Jeff Birnbaum, a senior systems engineer at Calif.-based Eaton's Westlake Village Information Management Systems Division. Birnbaum's main criticism of the device is that the documentation did not address the issue of how to use the Lanalyzer to do specific tests.

ITT's Kilman agreed that a sort of "cookbook" for using the Lanalyzer would be helpful, especially for those network administrators not entirely familiar with Ethernet protocols.

The fact that the Lanalyzer can be installed on IBM Personal Computers and compatible microcomputers was a plus for Birnbaum. He did, however, have a problem using the Lanalyzer board in microcomputers that were outfitted with other add-in boards.

He blew up the power supply in an Epson America, Inc. microcomputer and tripped a circuit breaker on an AT&T 6300 personal computer. "I think the problem was too much heat," he said.

Spartacus has used the Lanalyzer to evaluate network load and performance in order to determine if the additional load from new nodes would affect current network users.

Gary Malkin, a senior member of Spartacus' technical staff, said it takes time to set up tests on the device. But he maintained that performing load analysis did not require extensive understanding of how networks operate.

Having worked with the device for a number of months, Malkin has learned some basic troubleshooting routines. He generally checks network servers for errors first. If there is a pattern to the problem — for instance, everyone dealing with a given node is having a problem — Malkin traps all the traffic to that node.

New Jersey Bell from **page 6**

First Jersey, one of the largest banks in the state, is initially using PDN to replace costly private lines used to back-up other leased facilities in emergency situations, said James McLaine, executive vice-president of First Jersey. "Should a disaster occur at our computer center, we'll send our tapes over to our back-up site, and that site will transmit our account records to our branches and automated teller machines using PDN," McLaine said.

> *"CO LAN is based on AT&T's Datakit."*

CO LAN is a new option available to New Jersey Bell Centrex customers. Data/voice multiplexers installed at both the customer's site and central office switch locations enable customer computers in one or several offices to be connected via standard telephone lines. The local-area networking software is resident in the Centrex switch.

While traditional local networks require the user to purchase on-premises equipment, New Jersey Bell argues that the cost, flexibility, service and support offered by CO LANs will attract both large and small business users. "With technology changing so rapidly, it doesn't make sense for a user to invest in hardware and software that will probably be obsolete in a few years," Seazholtz said.

CO LAN also obviates the need for users to lay out capital investments for customer premises equipment.

AT&T Bell Laboratories is using New Jersey Bell's CO LAN service to connect 600 engineering workstations in several locations within the state. Engineers working at home can also use CO LAN. CO LAN is based on AT&T's Datakit technology, which forms the basis for AT&T's Starlan local-area network. New Jersey Bell acquired its CO LAN software and hardware from AT&T. The BOC can also provide customers with a 1.5M bit/sec link from CO LAN to Starlan networks.

While Bell Labs presently has the ability to monitor CO LAN traffic via the central office switch, New Jersey Bell hopes to extend all the Centrex customer control features to the CO LAN.

Yet another technology unveiled by New Jersey Bell is DCS, a service meant to replace AT&T's Dataphone Digital Service. DCS supports data rates up to 56K bit/sec. It is based on digital cross-connect systems and T-1 digital pipes within New Jersey Bell's network.

Tandem from **page 4**

dem officials claim.

"With this controller, you don't change any of the system hardware. All you change is the software on the controller," according to Andy Parker, Tandem product manager for communications products. The protocol on each Clip gives Tandem software applications on the host access to the communications controller.

The 6105 controller, in conjunction with an external patch panel, supports a variety of interfaces, including RS-232 and RS-449. The 6105 controller is also dual-ported for fault-tolerance.

> *"All you change is the software."*

The 6105 is expected to replace other Tandem bit-synchronous and byte-synchronous controllers and will be compatible with the higher capacity Tandem 6100 communications controllers, a Tandem spokeswoman said. A 6105 controller will be packaged with each Nonstop EXT-10 and EXT-25 system or can be purchased separately for $5,455.

The new Nonstop EXT-10 and EXT-25 systems are positioned as entry-level systems or branch office systems for corporations looking to distribute processing horsepower through networking.

Both the EXT-10 and EXT-25 are equipped with two processors, but can be expanded to four each.

A basic EXT-10 is priced at $82,500 and comes with 8M bytes of main memory, expandable to 32M bytes. Tandem officials claim the two-processor EXT-10 has been rated at 4.3 transactions per second, while the four-processor system can perform 8.6 transactions per second. The basic EXT-25 system lists for $325,000 and has 16M bytes of main memory, expandable to 64M bytes.

The dual-processor system has been rated at 11 transactions per second, while its four-processor system can achieve 22 transactions per second, Tandem claims.

Both systems come with a 128M-byte Winchester hard disk, disk controllers and a cartridge magnetic tape drive. Each can be configured to support up to 100 directly connected terminals and 15 or 31 I/O slots. Tandem is also expected to introduce its 6526 terminal today. It will be compatible with Tandem's 6530 series terminals and will support character and block mode communications with Tandem hosts. It will list for $1,095.

HORRELLSCOPES

BY EDWARD HORRELL

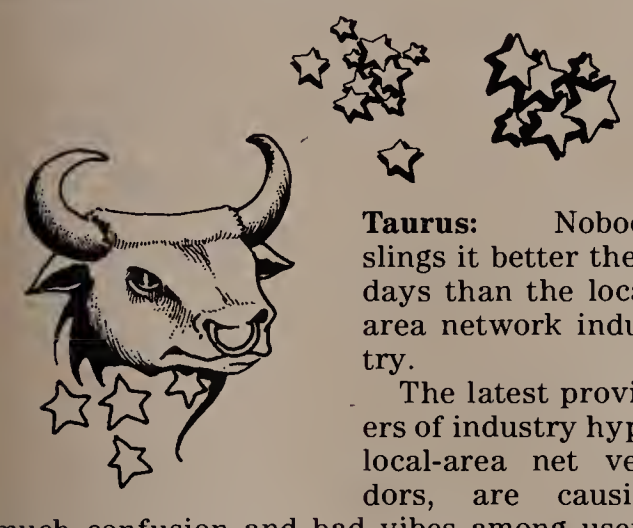
In communications today, it takes more than just good business sense to survive; it requires celestial guidance.

Pisces: A fishy "big catch" describes some recent contracts announced by the federal government.

The National Security Agency has awarded production contracts to AT&T, Motorola, Inc. and RCA Corp. for scrambler telephones. This security venture — worth $190 million in taxes — will go toward the production of 50,000 telephones.

According to contract specifications, the new telephones should take a person's voice and arrange it into a group of random noises. Incidentally, these noises make no sense until they arrive at the other end of the line and are put back into their proper order.

Horrellscopes applauds this stellar breakthrough in federal government telecommunications. Currently, the incoherent noise coming from the Feds isn't put into any understandable format.



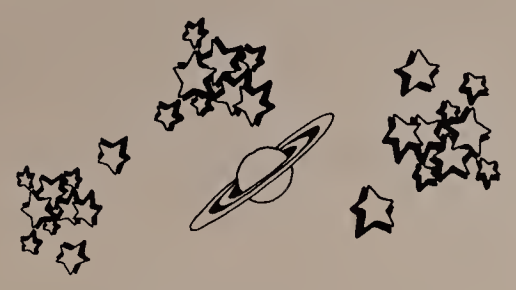
Taurus: Nobody slings it better these days than the local-area network industry.

The latest providers of industry hype, local-area net vendors, are causing much confusion and bad vibes among users. Recent readings in the local-area network atmosphere show that users are dissatisfied with the results and costs of these communications systems. And they say hidden costs have caused the expense of installing a local-area net to skyrocket. A change in user and vendor alignment is imperative, as users will not stand for this long. The local net industry is becoming so popular that a major cosmic collision between users and vendors will occur unless there is a change of course.

Until the local-area network planets get themselves properly aligned, users should remember a couple of things.

- Local-area net decisions should be based upon performance and application issues, not technological ones. Users should study requirements and develop solutions, instead of the other way around. Remember, if it ain't broke, don't fix it.
- Budget pessimistically and include in calculations such items as training, installation and wiring.
- Prototypes are fun toys. But beware! Get a system large enough to fit the future.

Horrell is president of Mitchell & Horrell, Inc. in Memphis, Tenn.



Cosmic catastrophe of the month

AT&T and Rolm Corp. are tied for this month's cosmic snafu. In fact, their two new products — AT&T's System/25 and Rolm's Redwood — are possibly the biggest insults to the small-business market to streak through the galaxy in a long time.

One of the growth markets for the 1980s is going to be the small-business market, the 25-to-100-telephone system operations. These two cosmic giants tried to tap into that market with their new products.

But Rolm's Redwood doesn't allow for data to be switched, and the System/25 allows for data, but won't allow digital telephones to be connected to the system.

What this country needs is a better space program and a good small-business telecommunications system.

Small-business men deserve better, but no one appears to be listening.

Leo: The lion's share of new products goes to IBM, as usual.

IBM has spun off a galaxy of new offerings. A total of 125 new products and enhancements were launched during the recent National Computer Conference.

What's significant is the number of products and enhancements that address connectivity, or the ability to connect non-IBM products with the IBM family.

It's IBM's way of saying to users: "So you made a bad choice. We can fix it."

Like it or not, IBM is the tail that wags the dog. And even as the dog gets bigger, IBM keeps on wagging. Compatibility is a must for business competitors. Without it, life is full of worms — ask Apple Computer, Inc.

Now IBM realizes that there's money in making connections, and the company is adapting to competitors. IBM is also making strides in allowing incompatible IBM devices to communicate with IBM.

And that's the name of the biggest game in town.

Scorpio: Local-area net users of existing cable facilities may be in for a shock.

Many first-time local-area net users are experiencing space trouble. Space in the telephone wiring, that is. These new users believe they can use existing wiring.

But in spite of what many local-area network vendors advertise, users cannot always use the wiring they already have. Not all telephone cable is twisted wiring and vice versa.

Users need to get a complete cable inventory before designing their systems. If there is a question, they must call in a trusted third party.

Sagittarius: A good hunter looks for a back-up power source *before* the lights go out.

Back-up power for telecommunications systems, especially for private branch exchanges, is becoming increasingly important. More and more businesses are using the PBX for both voice and data, creating a greater risk of system failure.

Users should take four steps to ensure their systems do not collapse when they're needed most. First, do not forget to plan for ample space for the power system in the equipment room.

Second, be sure to plan for power system maintenance.

Third, be sure to test the power system occasionally.

Fourth, pay attention to local building and fire codes when dealing with batteries.

It goes without saying that an ounce of prevention is worth a world of cure. So plan for a disaster.

Shooting Stars

Occasionally, a star that at first glance appears insignificant becomes a major influence in the course of events. One corporate body coming into sight is Siemens Corp.

Once just another "me too" player in the PBX and central office system market, Siemens is beginning to shine brightly.

A subsidiary of the West German giant Siemens AG, Siemens is taking action while its competitors are talking.

Siemens' central office switch is being tested with Integrated Systems Digital Networks. Siemens recently announced a couple of deals with the Bell operating companies, breaking up the AT&T/Northern Telecom, Inc. private party. And the distribution of their fine PBX family, primarily through Telplus and Contel-Executone, is strong.

Stargazers should keep their sights high . . . and moving higher . . . to focus in on Siemens.

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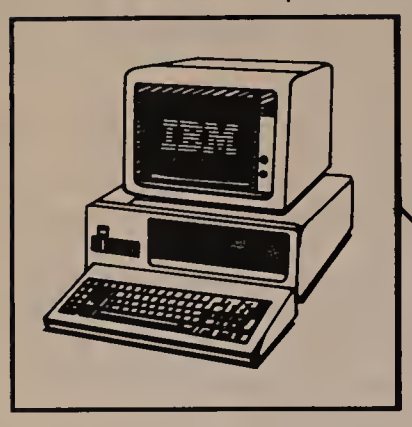

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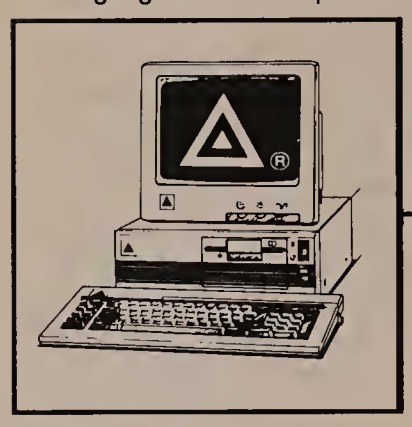

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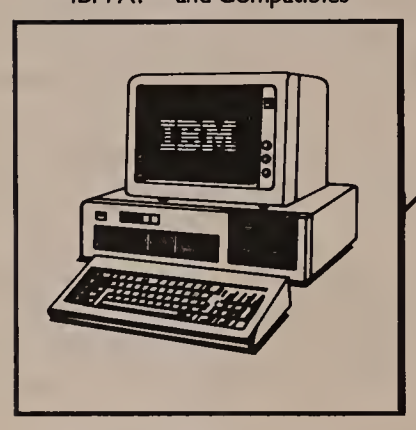

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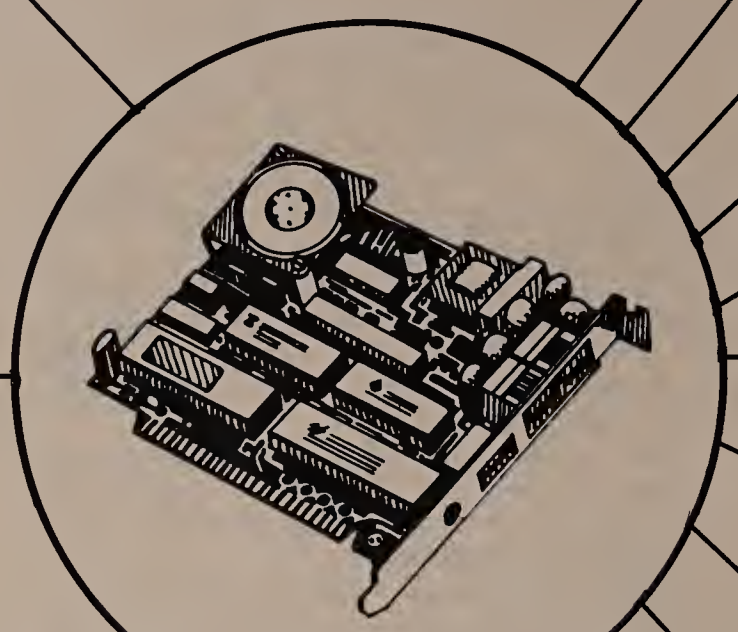

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